

**FINAL A STREET POND EXPANSION  
ENVIRONMENTAL ASSESSMENT  
AT  
BEALE AIR FORCE BASE, CALIFORNIA**

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**Beale Air Force Base  
Environmental Flight  
6601 B Street  
Beale Air Force Base, CA 95903-1712**

**SEPTEMBER 2008**

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**FINDING OF NO SIGNIFICANT IMPACT  
AND  
FINDING OF NO PRACTICABLE ALTERNATIVE**

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**1.0 PURPOSE AND NEED OF PROPOSED ACTION**

The A Street Pond is a wastewater holding pond located in the central portion of Beale AFB that has been highly disturbed over the years. Currently, wastewater treatment plant (WWTP) effluent consisting of treated wastewater as well as effluent from the Environmental Restoration Program (ERP) Site 13 pump and treat system is pumped to the 1.8 million gallon A Street Pond. The pond can provide up to 1 million gallons of water per day for irrigation at the golf course and is authorized to do so by the California Regional Water Quality Control Board (CRWQCB).

The proposed project is to increase the capacity of A Street Pond in order to hold more treated wastewater. Additionally, a conveyance pipeline would be constructed from A Street Pond to the Beale AFB baseball fields in order to facilitate the land application of the additional effluent. The main pond used to hold effluent, Pond 4, becomes close to full capacity during the rainy season, November through May. Expansion of A Street Pond would allow additional storage capacity when Pond 4 capacity is reached during unexpected storm events or upset conditions. This would avoid the need to discharge effluent into surface waters during such events. Currently, effluent is land applied at the 40-acre spray field near the WWTP and the golf course. Expansion of A Street Pond would allow for land application of additional effluent at the Beale AFB baseball field instead of discharging into surface waters, where stringent effluent limits must be met.

The current system of using effluent for irrigation purposes saves millions of gallons of potable water each year. Expansion of A Street Pond and the construction of an additional conveyance pipeline would support additional irrigation locations and consequently save even more potable water.

**2.0 DESCRIPTION OF PROPOSED ACTION AND NO ACTION  
ALTERNATIVE**

**2.1 Proposed Action**

The Proposed Action consists of the expansion of the A Street Pond in two phases, which would impact approximately 304,440 ft<sup>2</sup> (6.99 acres). The proposed project would expand the existing water storage capacity of A Street Pond, and install piping to transfer water to irrigate portions of the Base.

The A Street Pond Expansion Project would be completed in two phases. Phase 1 of the project would involve expanding the pond to provide an additional 11.5-million gallon capacity. The Base proposes to expand the pond west into an adjacent borrow pit where soil was excavated and used for past maintenance and repair work at Base landfill areas and north to encompass a 200- by 300-foot area that would

connect to the A Street Pond through a pipeline with a valve. This phase would also install mechanical aeration equipment that would be anchored to the bottom of the pond in central locations. No additional pumping equipment would be installed.

Phase 1 of the proposed project would also install a piping system from the A Street Pond to the Beale AFB baseball fields for irrigation. The pipeline would run north on A Street, west on 23rd Street, then north on C Street to the baseball fields. The trenching would be 3 to 4 feet deep and 2 to 3 feet wide.

Phase 2 of the proposed project would expand the southern edge of the A Street Pond and would increase the total capacity to 20-million gallons. The A Street Pond lies adjacent to grassland with wetlands present to the south and east and olive groves present to the west and northwest. Expansion of the A Street Pond would require removal of olive trees and rerouting a drainage ditch that currently runs north to south, between the pond and the borrow pit.

## **2.2 No Action Alternative:**

Storage capacity of the A Street Pond would not be increased. Currently, the pond can provide up to 1 million gallons per day of water, sufficient for golf course irrigation but not for other locations on the installation.

## **3.0 SUMMARY OF ENVIRONMENTAL EFFECTS**

***Air Quality.*** Combustive emissions from construction equipment would be generated during construction. Fugitive dust would be generated from ground-disturbing activities such as site clearing, grading, and vehicular traffic moving over the disturbed site. However, these effects would not be substantial. Since Beale AFB is located in an unclassified/attainment area for criteria pollutants identified by the Environmental Protection Agency, no formal conformity analysis is required.

***Biological Resources.*** Seasonal wetlands occur within the Proposed Action area and approximately 0.223 acre (0.162 direct and 0.061 indirect) of seasonal wetlands may be impacted. To minimize or compensate for potential impacts associated with the Proposed Action, 0.162 acre of vernal pools or seasonal wetlands would be preserved and 0.055 acre would be restored on Beale AFB or at another wetland preservation bank approved by the U.S. Fish and Wildlife Service (USFWS).

Beale AFB initiated formal consultation with the USFWS on February 28, 2008 with the A Street Pond Expansion Biological Assessment. Based on negative results from 2006 dry season and 2007 wet season sampling for vernal pool crustaceans and the poor quality habitat in the project area, Beale AFB argued that the project is not likely to adversely affect vernal pool crustacean habitat. Results received in July 2008 for the 2008 dry season sampling revealed the presence of vernal pool crustacean cysts in a drainage 350 ft upstream from the project area. The presence of the cysts triggered a likely to adversely affect determination from the USFWS; however, the USFWS also determined that the project is not likely to jeopardize the continued existence of the two



vernal pool crustacean species or destroy/adversely modify critical habitat for either species because no critical habitat for these species has been designated or proposed within the action area of the proposed project.

Impacts to vernal pool crustaceans would not be significant because compensation for impacts to their habitat would occur per the Beale AFB Habitat Conservation and Management Plan and the environmental protection measures listed in Table 2-3 in the Environmental Assessment (EA) and in the Biological Opinion from the USFWS would be followed. Additionally, the hydrology of the drainage in which the vernal pool crustacean cysts were found would not change because the drainage will be re-routed around the project area.

**Water Resources.** Clean Water Act permit applications have been submitted for Phase I, which would impact a total of 0.114 acres of jurisdictional waters of the U.S. Clean Water Act permits will be submitted for Phase II before the project is scheduled to occur, which would impact a total of 1.844 acres of jurisdictional waters of the U.S. Where compensation is required, it would occur at a 1:1 ratio. Impacts to jurisdictional waters where there is no net loss (e.g., where a drainage will be re-routed) do not require compensation. Additionally, compensation for jurisdictional waters is not required when the feature has already been compensated for a threatened and endangered species habitat.

Implementation of the Proposed Action would not be expected to have direct or indirect adverse effects on water quality. Land application of effluent would occur in the same manner as it is currently occurring at the golf course. At the golf course, effluent is only land applied at night. The effluent would meet Waste Discharge Requirements prescribed by the Beale AFB Land Based Discharge National Pollutant Discharge Elimination System (NPDES) permit from the California Regional Water Quality Control Board. If the Beale AFB waste water treatment plant is upgraded to perform tertiary treatment in the future, restrictions on watering practices may be relaxed.

The Proposed Action would minimally increase the impervious surface area and runoff on the installation. At the proposed project area, storm water runoff would flow into drainage systems that are of sufficient capacity. With adherence to best management practices (Table 2-3 in the EA), adverse effects from erosion would be avoided.

The Proposed Action could impact about 0.4 and 3.9 acres of the 100- and 500-year floodplains, respectively. During construction, impacts would be minimized by using best management practices (Table 2-3). In addition, the Proposed Action would be designed to allow adequate storm water drainage and free flow of water during rain events.

The Proposed Action would not adversely impact water resources at Beale AFB.

**Cultural Resources.** There were no cultural resource sites listed in the Beale AFB Cultural Resource Management Plan within the Area of Potential Impact. The Proposed Action would not be expected to impact cultural resources; therefore, there would be no adverse effects. Previously unidentified subsurface archaeological deposits might exist

within the boundary of the Proposed Action. Implementation of the Standard Operating Procedures contained in the Beale AFB Integrated Cultural Resources Management Plan (ICRMP) (BAFB 2008) and the cultural resources environmental protection measures contained in the EA (Table 2-3 in the EA) would ensure that the Proposed Action would not result in adverse effects on potentially eligible cultural resources. There would be no indirect or adverse impacts on unknown, potentially eligible cultural resources.

***Geological Resources.*** There would be no significant impacts on geological resources as a result of implementation of the Proposed Action. Construction at Beale AFB would occur within an area where the physiographic features and geologic resources have been, in part, disturbed and modified by prior construction. Impacts to physiography and geology would be minimal.

Earthwork at the project sites would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. The effects on soil erosion and sedimentation from construction activities are considered minor because erosion and sediment controls would be in place during construction to reduce and control siltation or erosion impacts to areas outside of the construction site. With incorporation of best management practices (Table 2-3 in the EA), impacts to soils would not be considered significant.

***Restoration, Hazardous Materials and Wastes.*** There would be no significant impacts from hazardous materials and wastes from the Proposed Action. Minor hazardous materials and wastes would be generated during project construction. In addition, the Proposed Action is the administrative boundary of two Environmental Restoration Program (ERP) sites: ST-22, Basewide Underground Storage Tanks and SS-39, Building 2145. Because of the potential threat of contamination from ERP sites during construction, it is recommended that a health and safety plan be prepared in accordance with Occupational Safety and Health Administration (OSHA) requirements prior to commencement of construction activities. In addition, should contamination be encountered, then handling, storage, transportation, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations, Air Force Instructions, and Beale AFB programs and procedures. Although the project is within ERP administrative site boundaries, 9 CES/CEVR determined that an ERP waiver is not necessary for the project because contamination is not present at the project site.

***Noise.*** The Noise Element of the Yuba County General Plan has identified the recommended ambient allowable noise level for agricultural and low-density residential land uses to be 50 dB at any time of day. The Proposed Action is not likely to generate excessive noise. The nearest sensitive noise receptor is over 2.5 miles from the project location. Therefore, the Proposed Action would not be expected to cause adverse noise impacts.

***Safety and Military Munitions Response Program (MMRP).*** Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not be expected to pose a safety risk to Base personnel or activities. The

proposed construction projects would enable the Base to meet future mission objectives and conduct or meet mission requirements in a safe operating environment.

Although none of the proposed project sites are located on any Munitions Response Areas (MRA), safety measures must still be taken until the MRAs are further delineated. Contractors would be required to comply with the Environmental Protection Measures for MMRP (Table 2-3 in the EA) thereby reducing impacts to less than significant. During trenching, construction workers would have a possibility of encountering unexploded ordnances or chemical agent identification sets. Contractors would be required to comply with the Environmental Protection Measures for the Military Munitions Response Program, thereby reducing impacts to less than significant.

**Transportation.** Vehicles necessary for construction may have a minor adverse impact on Base roads. All road and lane closures would be coordinated with the Security Forces and would be temporary in nature; therefore, no significant adverse effects on transportation systems would be expected.


#### 4.0 CONCLUSION

Based on the provisions set forth in the Proposed Action, all activities were found to comply with the criteria or standards of environmental quality and would be coordinated with the appropriate Federal, state, and local agencies. The attached EA and a draft of this Finding of No Significant Impact/Finding of No Practicable Alternative (FONSI/FONPA) were made available to the public on in August 2007 for a 30-day review period.

#### 5.0 FINDINGS

**Finding of No Practicable Alternative.** Reasonable alternatives were considered, but no other alternative to the Proposed Action meets the safety or operational requirements of the 9th Reconnaissance Wing. Pursuant to Executive Orders 11988 and 11990 and the authority delegated by Secretary of the Air Force Order 791.1, and taking the above information into account, I find that there is no practicable alternative to this action and that the Proposed Action includes all practicable measures to minimize harm to the environment.

**Finding of No Significant Impact.** After review of the EA prepared in accordance with the requirements of the National Environmental Quality Act (NEPA), the Council on Environmental Quality (CEQ) regulations, and the Environmental Impact Analysis Process (EIAP), 32 CFR Part 989, as amended, I have determined that the Proposed Action would not have a significant impact on the quality of the human or natural environment. An Environmental Impact Statement (EIS) will not be prepared.

  
TIMOTHY A. BYERS  
Brigadier General, USAF  
Director of Installations (A7) and Mission Support

23 OCT 08  
Date

## ACC/A7E-2 Assistant Executive Officer

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**From:** ACC/A7E-2 Assistant Executive Officer  
**Sent:** Friday, October 24, 2008 5:01 PM  
**To:** Byers, Timothy A BrigGen USAF ACC/A7  
**Cc:** ACC/A7 Executive Support; ACC/A7P Programs (Distro List)  
**Subject:** A7 Sign//Final Environmental Assessment (EA) A Street Pond Expansion, Beale AFB, California  
**Attachments:** A\_St\_Pond\_FONSI\_FONPA.pdf

MEMORANDUM FOR A7PP lhd 10/20/08  
A7P jgs 10/21/08  
A7E-2 jda//23 Oct 2008//General, printed for your sig and placed in your inbox -- v/r jim  
A7-2 rjw//24 Oct 08//  
A7  
IN TURN

FROM: A7PP (Parker)

SUBJECT: Final Environmental Assessment (EA) A Street Pond Expansion, Beale AFB, California

1. Request coordination on the attached Finding of No Significant Impact/Finding of No Practicable Alternative (FONSI/FONPA) and forwarding to ACC/A7 for approval and signature. The final EA and associated FONSI/FONPA have been prepared to meet the environmental impact analysis requirements of the National Environmental Policy Act. Under the proposal, the U.S. Air Force would increase the capacity of A Street Pond in order to hold more treated water. Additionally, a conveyance pipeline would be constructed from A Street Pond to the Beale AFB baseball fields in order to facilitate land application of the additional effluent.
2. The EA and draft FONSI/FONPA have been reviewed by base and MAJCOM interdisciplinary team members, as well as undergoing a 30 day public review and comment period. Revisions based on comments received have been incorporated into the final documents. MAJCOM signature on the FONSI/FONPA is required in accordance with 32 CFR 989.14 (g) and HQ ACC/CV memo dated 27 Apr 2005, which identify environmental analysis and FONSI/FONPA approval and signature authority for proposed Air Force actions involving construction in wetlands or floodplains.
3. Recommend coordination on the FONSI/FONPA and forwarding for A7 signature.

//signed//  
Sheryl K. Parker  
Environmental Analysis Project Manager  
4-9334

Attachment:  
Unsigned FONSI/FONPA  
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# **Executive Summary**

## **ES.1 Project Background**

Beale Air Force Base (AFB) is a U.S. Air Force (USAF) base under the Air Combat Command (ACC). Beale AFB is headquarters to the 9th Reconnaissance Wing (9 RW) that is responsible for providing national and theater command authorities with timely, reliable, high-quality, high-altitude reconnaissance products. To accomplish this mission, 9 RW is equipped with a fleet of U-2 and Global Hawk reconnaissance aircraft and associated support equipment. The wing maintains a high state of readiness in its combat support and combat service support forces for potential deployment in response to theater contingencies. The 9 RW also provides support for Beale AFB, ranging from financial, personnel, housing, maintenance, legal, recreational, and medical needs to fire protection, chaplain services, and Base security.

Beale AFB is a 22,944-acre military installation in Yuba County, California, approximately 40 miles north of Sacramento, 13 miles east of Marysville, and 25 miles west of Grass Valley (see Figure 1-1). The Base is between the Yuba and Bear Rivers in an area characterized by the transition from the western Sacramento Valley east to the Sierra Nevada foothills.

## **ES.2 Purpose of and Need for the Proposed Action**

The A Street Pond is a wastewater holding pond located in the central portion of Beale AFB which has been highly disturbed over the years. Currently, WWTP effluent is pumped to the 1.8 million gallon A Street Pond. The pond can provide up to 1 million gallons of water per day for irrigation at the golf course and is authorized to do so by the Regional Water Quality Control Board.

The proposed project is to increase the capacity of A Street Pond in order to hold more treated wastewater. Additionally, pipeline would be constructed from A Street Pond to the Beale AFB baseball fields in order to facilitate the land application of the additional wastewater. The main pond used to hold treated wastewater, Pond 4, becomes close to full capacity during the rainy season, November through May. Expansion of A Street Pond would allow additional storage capacity when Pond 4 fills to capacity during unexpected storm events or upset conditions. This would avoid the need to discharge wastewater effluent into surface waters during such events. Currently, wastewater effluent is land based at the 40-acre spray field near the WWTP and the golf course. Expansion of A Street Pond would allow for land application of additional treated wastewater at the Beale AFB baseball field instead of discharging into surface waters, where stringent effluent limits must be met.

## ES.3 Proposed Action and No Action Alternative

### ES.3.1 Proposed Project

Expansion of the A Street Pond would be completed in two phases. Phase 1 of the A Street Pond expansion consists of installing a pipeline and expanding the A Street Pond. Phase 1 would provide an additional 11.5-million gallon capacity for recycled wastewater storage. The Base proposes to expand the pond west into an adjacent borrow pit where soil was excavated and used for past maintenance and repair work at Base landfill areas and north to encompass a 200- by 300-foot area that would connect to the A Street Pond through an underground pipeline with a valve. A Street Pond would be deepened by 6 feet and a 60-foot wide berm (0.16 acre) between the current A Street Pond and the borrow pit would be removed. Additionally, a piping system would be installed from the A Street Pond area to the Beale AFB baseball fields to transfer irrigation water. The total acreage for expansion from Phase 1 would be 3.45 acres. Phase 2 would further expand the southern portion of the A Street Pond to provide a total 20-million gallon capacity for recycled wastewater. The Proposed Action impact would total approximately 304,440 ft<sup>2</sup> (6.99 acres).

### ES.3.2 No Action Alternative

The storage capacity of the A Street Pond would not be increased. Currently, the pond can provide up to 1 million gallons per day of water, sufficient for golf course irrigation but not for other Base locations. Any excess water produced during unexpected storm events would be discharged to surface water, which would require Beale AFB to renew its NPDES discharge permit that allows discharge to Hutchinson Creek.

## ES.4 Summary of Environmental Effects

**Air Quality.** Combustive emissions from construction equipment would be generated during construction. Fugitive dust would be generated from ground-disturbing activities such as site clearing, grading, and vehicular traffic moving over the disturbed site. However, these effects would not be substantial (see Appendix A). Since the Base is located in an unclassified/attainment area for criteria pollutants identified by the Environmental Protection Agency, no formal conformity analysis is required.

**Biological Resources.** Seasonal wetlands occur within the Proposed Action area and approximately 0.223 acre (0.162 direct and 0.061 indirect) of seasonal wetlands may be impacted. To minimize or compensate for potential impacts associated with the Proposed Action, 0.162 acre of vernal pools or seasonal wetlands would be preserved and 0.055 acre would be restored on Beale AFB or at another wetland preservation bank approved by the U.S. Fish and Wildlife Service (USFWS).

Beale AFB initiated formal consultation with the USFWS on February 28, 2008 with the A Street Pond Expansion Biological Assessment. Based on negative results from 2006 dry season and 2007 wet season sampling for vernal pool crustaceans and the poor quality habitat in the project area, Beale AFB argued that the project is not likely to

adversely affect vernal pool crustacean habitat. Results received in July 2008 for the 2008 dry season sampling revealed the presence of vernal pool crustacean cysts in a drainage 350 ft upstream from the project area. The presence of the cysts triggered a likely to adversely affect determination from the USFWS; however, the USFWS also determined that the project is not likely to jeopardize the continued existence of the two vernal pool crustacean species or destroy/adversely modify critical habitat for either species because no critical habitat for these species has been designated or proposed within the action area of the proposed project.

Impacts to vernal pool crustaceans would not be significant because compensation for impacts to their habitat would occur per the Beale AFB Habitat Conservation and Management Plan (referenced in the Beale AFB Integrated Natural Resources Management Plan) and the environmental protection measures listed in Table 2-3 and in the Biological Opinion from the USFWS would be followed. Additionally, the hydrology of the drainage in which the vernal pool crustacean cysts were found would not change because the drainage will be re-routed around the project area.

**Water Resources.** Clean Water Act permit applications have been submitted for Phase I, which would impact a total of 0.114 acres of jurisdictional waters of the U.S. Clean Water Act permits will be submitted for Phase II before the project is scheduled to occur, which would impact a total of 1.844 acres of jurisdictional waters of the U.S. Where compensation is required, it would occur at a 1:1 ratio. Impacts to jurisdictional waters where there is no net loss (e.g., where a drainage will be re-routed) do not require compensation. Additionally, compensation for jurisdictional waters is not required when the feature has already been compensated for a threatened and endangered species habitat.

Implementation of the Proposed Action would not be expected to have direct or indirect adverse effects on water quality. Land application of effluent would occur in the same manner as it is currently occurring at the golf course. At the golf course, effluent is only land applied at night. The effluent would meet Waste Discharge Requirements prescribed by the Beale AFB Land Based Discharge National Pollutant Discharge Elimination System (NPDES) permit from the CRWQCB. If the Beale AFB WWTP is upgraded to perform tertiary treatment in the future, restrictions on watering practices may be relaxed.

The Proposed Action would minimally increase the impervious surface area and runoff on the installation. At the proposed project area, storm water runoff would flow into drainage systems that are of sufficient capacity. With adherence to best management practices (Table 2-3), adverse effects from erosion would be avoided.

The Proposed Action could impact about 0.4 and 3.9 acres of the 100- and 500-year floodplains, respectively. During construction, impacts would be minimized by using best management practices (Table 2-3). In addition, the Proposed Action would be designed to allow adequate storm water drainage and free flow of water during rain events.

The Proposed Action would not adversely impact water resources at Beale AFB.



**Cultural Resources.** There were no cultural resource sites listed in the Beale AFB Cultural Resource Management Plan within the Area of Potential Impact. The Proposed Action would not be expected to impact cultural resources; therefore, there would be no adverse effects. Previously unidentified subsurface archaeological deposits might exist within the boundary of the Proposed Action. Implementation of the Standard Operating Procedures contained in the Beale AFB ICRMP (BAFB 2008a) and the cultural resources environmental protection measures contained in this EA (Table 2-3) would ensure that the Proposed Action would not result in adverse effects on potentially eligible cultural resources. There would be no indirect or adverse impacts on unknown, potentially eligible cultural resources.

**Geological Resources.** There would be no significant impacts on geological resources as a result of implementation of the Proposed Action. Construction at Beale AFB would occur within an area where the physiographic features and geologic resources have been, in part, disturbed and modified by prior construction. Impacts to physiography and geology would be minimal.

Earthwork at the project sites would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. The effects on soil erosion and sedimentation from construction activities are considered minor because erosion and sediment controls would be in place during construction to reduce and control siltation or erosion impacts to areas outside of the construction site. With incorporation of best management practices (Table 2-3), impacts to soils would not be considered significant.

**Restoration, Hazardous Materials and Wastes.** There would be no significant impacts from hazardous materials and wastes from the Proposed Action. Minor hazardous materials and wastes would be generated during project construction. In addition, the Proposed Action is the administrative boundary of two Environmental Restoration Program (ERP) sites: ST-22, Basewide Underground Storage Tanks and SS-39, Building 2145. Because of the potential threat of contamination from ERP sites during construction, it is recommended that a health and safety plan be prepared in accordance with Occupational Safety and Health Administration (OSHA) requirements prior to commencement of construction activities. In addition, should contamination be encountered, then handling, storage, transportation, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations, Air Force Instructions, and Beale AFB programs and procedures. Although the project is within ERP administrative site boundaries, 9 CES/CEVR determined that an ERP waiver is not necessary for the project because contamination is not present at the project site.

**Noise.** The Noise Element of the Yuba County General Plan has identified the recommended ambient allowable noise level for agricultural and low-density residential land uses to be 50 dB at any time of day. The Proposed Action is not likely to generate excessive noise. The nearest sensitive noise receptor is over 2.5 miles from the project location. Therefore, the Proposed Action would not be expected to cause adverse noise impacts.

**Safety and Military Munitions Response Program.** Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not be expected to pose a safety risk to Base personnel or activities. The proposed

construction projects would enable the Base to meet future mission objectives and conduct or meet mission requirements in a safe operating environment.

During construction activities associated with the Proposed Action, crew workers would have a possibility of encountering unexploded ordnance or chemical agent identification sets. Contractors would be required to comply with the Environmental Protection Measures (Table 2-3) for the Military Munitions Response Program, thereby reducing impacts to less than significant.

**Transportation.** Vehicles necessary for construction may have a minor adverse impact on Base roads. All road and lane closures would be coordinated with the Security Forces and would be temporary in nature; therefore, no significant adverse effects on transportation systems would be expected.

## **ES.5 Cumulative Impacts**

Cumulative impacts on environmental resources result from incremental effects of the Proposed Action, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

Table 5-1 summarizes potential cumulative effects on resources from the Proposed Action, when combined with other past, present, and future activities. No significant impacts on the environment would be anticipated from the Proposed Action in conjunction with these activities.

## ABBREVIATIONS AND ACRONYMS

9 CES/CEV	9th Civil Engineering Squadron/Environmental Flight
9 RW	9th Reconnaissance Wing
ACC	Air Combat Command
ACM	asbestos-containing material
AFB	Air Force Base
AFI	Air Force Instruction
AOC	Area of Concern
APE	Area of Potential Effect
AQCR	Air Quality Control Region
ARPA	Archaeological Resources Protection Act
BAFB	Beale Air Force Base
bgs	below ground surface
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAIS	Chemical Agent Identification Sets
Cal-EPA	California Environmental Protection Agency
CARB	California Air Resources Board
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CNDDB	California National Diversity Database
CO	carbon monoxide
ICRMP	Integrated Cultural Resources Management Plan
dB	decibel
dba	A-weighted decibel
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EQD	Explosive Quantity Distance
ERP	Environmental Restoration Program
ESS	Explosive Safety Submission
ft <sup>2</sup>	square feet
FIP	Federal Implementation Plan
FRAQMD	Feather River Air Quality Management District
HCMP	Habitat Conservation and Management Plan
HQ	Headquarters
HPTP	Historic Properties Treatment Plan
INRMP	Integrated Natural Resources Management Plan
IROD	Interim Record of Decision
LBP	lead-based paint
L <sub>dn</sub>	day-to-night noise level
mg/m <sup>3</sup>	milligrams per cubic meter
MC	munitions constituents
MILCON	Military Construction
MMRP	Military Munitions Response Program
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NLAA	Not Likely to Adversely Affect
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxide(s)
NPDES	National Pollutant Discharge Elimination System

NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O <sub>3</sub>	ozone
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
OWS	oil water separator
P.L.	Public Law
Pb	lead
PCE	tetrachloroethene
PM <sub>10</sub>	particulate matter less than or equal to 10 microns in diameter
PM <sub>2.5</sub>	particulate matter less than or equal to 2.5 microns in diameter
ppm	parts per million
PTO	Permit to Operate
QOL	Quality of Life
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
SE	Wing Safety
SFS	Security Forces Squadron
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO <sub>2</sub>	sulfur dioxide
SR	State Route
TCE	trichloroethene
TCP	Traditional Cultural Properties
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UST	underground storage tank
UXO	unexploded ordnance
VOC	volatile organic compound
WWTP	Wastewater Treatment Plant
µg/L	micrograms per liter
µg/m <sup>3</sup>	micrograms per cubic meter

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# **1.0 Introduction**

## **1.1 Background**

Beale Air Force Base (AFB) is a U.S. Air Force (USAF) base under the Air Combat Command (ACC). Beale AFB is headquarters to the 9th Reconnaissance Wing (9 RW) that is responsible for providing national and theater command authorities with timely, reliable, high-quality, high-altitude reconnaissance products. To accomplish this mission, 9 RW is equipped with a fleet of U-2 and Global Hawk reconnaissance aircraft and associated support equipment. The wing maintains a high state of readiness in its combat support and combat service support forces for potential deployment in response to theater contingencies. The 9 RW also provides support for Beale AFB, ranging from financial, personnel, housing, maintenance, legal, recreational, and medical needs to fire protection, chaplain services, and Base security.

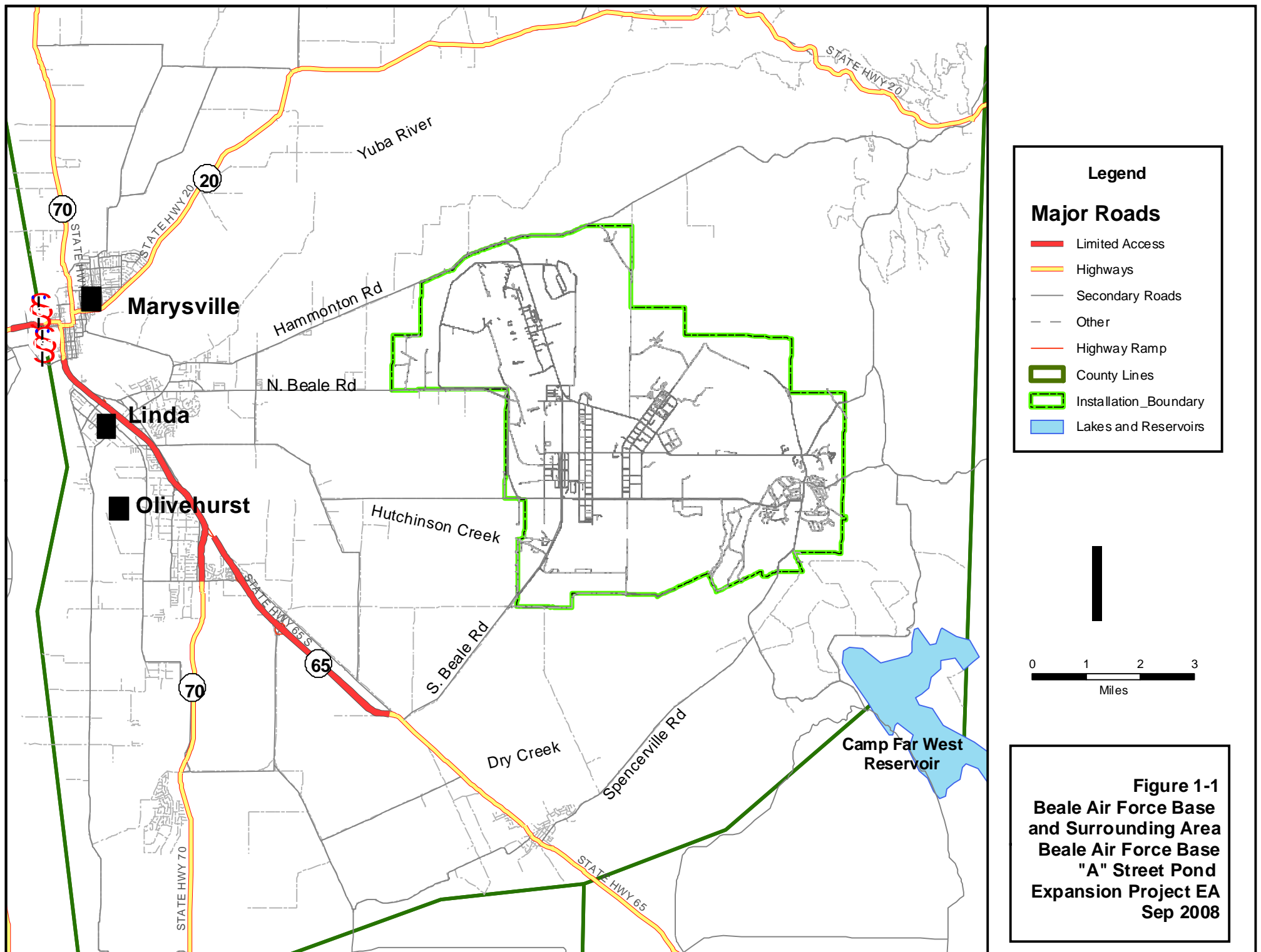
Beale AFB is a 22,944-acre military installation in Yuba County, California, approximately 40 miles north of Sacramento, 13 miles east of Marysville, and 25 miles west of Grass Valley (Figure 1-1). The Base is between the Yuba and Bear Rivers in an area characterized by the transition from the western Sacramento Valley east to the Sierra Nevada foothills.

## **1.2 Purpose and Need**

The A Street Pond is a wastewater holding pond located in the central portion of Beale AFB that has been highly disturbed over the years. Currently, wastewater treatment plant (WWTP) effluent consisting of treated wastewater as well as effluent from the Environmental Restoration Program (ERP) Site 13 pump and treat system is pumped to the 1.8 million gallon A Street Pond. The pond can provide up to 1 million gallons of water per day for irrigation at the golf course and is authorized to do so by the California Regional Water Quality Control Board (CRWQCB).

The proposed project is to increase the capacity of A Street Pond in order to hold more treated wastewater. Additionally, a conveyance pipeline would be constructed from A Street Pond to the Beale AFB baseball fields in order to facilitate the land application of the additional effluent. The main pond used to hold effluent, Pond 4, becomes close to full capacity during the rainy season, November through May. Expansion of A Street Pond would allow additional storage capacity when Pond 4 capacity is reached during unexpected storm events or upset conditions. This would avoid the need to discharge effluent into surface waters during such events. Currently, effluent is land applied at the 40-acre spray field near the WWTP and the golf course. Expansion of A Street Pond would allow for land application of additional effluent at the Beale AFB baseball field instead of discharging into surface waters, where stringent effluent limits must be met.

The current system of using effluent for irrigation purposes saves millions of gallons of potable water each year. Expansion of A Street Pond and the construction of an additional conveyance pipeline would support additional irrigation locations and consequently save even more potable water.



### **1.3 Scoping and Public Involvement Summary**

The following resources were identified as having the potential of being impacted:

- Air Quality
- Biological Resources
- Water Resources
- Cultural Resources
- Geological Resources
- Restoration, Hazardous Materials and Waste
- Noise
- Safety and Military Munitions Response Program

Public involvement included the release of the Draft Environmental Assessment (EA) for a 30-day public comment period in August 2007, announced in the local newspaper, the Marysville Appeal-Democrat, and the Base newspaper, the High Flyer (See Appendix C).

### **1.4 Permit and Consultation Requirements**

Formal consultation with the U.S. Fish and Wildlife Service (USFWS) has been completed for this project. The Biological Opinion (BO) from the USFWS is located at Appendix B.

Beale AFB has applied for Clean Water Act permits from the USACE and CRWQCB for Phase I. Clean Water Act permits would be submitted to the USACE and CRWQCB before construction. Approval of the Section 401 and 404 permit applications would be obtained prior to commencement of construction activities. Beale AFB will apply for permits for Phase II prior to construction. No schedule for Phase II currently exists, but the project is expected to occur within the next 5 years.

### **1.5 Purpose of the Environmental Assessment**

The Objective of this EA is to disclose and analyze potentially significant environmental impacts expected from implementation of the Proposed Action that include development projects and long-term mission-based actions at Beale AFB in accordance with the General Plan. A secondary objective of this EA is to determine potential cumulative impacts from the Proposed Action to air quality, biological resources, water resources, hazardous materials and waste management, noise, safety and military munitions response program, and transportation resources. This EA will discuss direct, indirect, permanent, and temporary impacts at or near project sites to resource areas including wetlands, waters of the U.S., and threatened and endangered species and their habitat.

This EA has been prepared to satisfy the requirements of NEPA (Public Law [P.L.] 91-190, Title 42; United States Code [U.S.C.], Section 4321 et seq., as amended). NEPA legislated a structured approach to environmental impact analysis that requires Federal agencies to use an interdisciplinary and systematic approach in their decision-making process. This process evaluates potential environmental consequences associated with a proposed action and considers alternative courses of action. The intent of NEPA is to

protect, restore, and enhance the environment through well-informed Federal decisions. In addition, this document has been prepared in accordance with Air Force Instruction (AFI) 32-7061, *Environmental Impact Analysis Process* (EIAP), as set forth in Title 32 Code of Federal Regulations (CFR) Part 989, which implements Section 102(2) of NEPA and regulations established by the Council on Environmental Quality (CEQ).

## **1.6 Analysis Approach**

The proposed A-Street Pond Expansion project was among a group of projects that were originally part of the Draft Multi-Project EA that was released for public comment in August 2007 (See Appendix C). When USFWS consultation was delayed for several projects, the A-Street Pond Expansion project was taken from the Draft Multi-Project EA to create a separate EA.

## 2.0 Proposed Action and Alternatives

This section describes the Proposed Action, discusses the No Action Alternative, and describes the alternatives considered but eliminated from further review.

### 2.1 Proposed Action

The Proposed Action consists of the expansion of the A Street Pond in two phases, which would impact approximately 304,440 ft<sup>2</sup> (6.99 acres). The proposed project would expand the existing water storage capacity of A Street Pond, and install piping to transfer water to irrigate portions of the Base. The A Street Pond is centrally located on Beale AFB, east of A Street, between North Beale Road and Gavin Mandery Drive (Figure 2-1). Currently, WWTP effluent is pumped to the 1.8 million gallon A Street Pond. The pond can provide up to 1 million gallons of water per day for irrigation at the golf course and is authorized to do so by the RWQCB. Waste Discharge Requirements governing Beale AFB's effluent will change on April 1, 2009, after which time all WWTP effluent will be land applied. WWTP effluent can be used at the golf course and throughout the main Base for irrigation purposes as authorized by the RWQCB.

The A Street Pond Expansion Project would be completed in two phases (Figure 2-2). Phase 1 of the project would involve expanding the pond to provide an additional 11.5-million gallon capacity. The Base proposes to expand the pond west into an adjacent borrow pit where soil was excavated and used for past maintenance and repair work at Base landfill areas and north to encompass a 200- by 300-foot area that would connect to the A Street Pond through a pipeline with a valve. This phase would also install mechanical aeration equipment that would be anchored to the bottom of the pond in central locations. No additional pumping equipment would be installed.

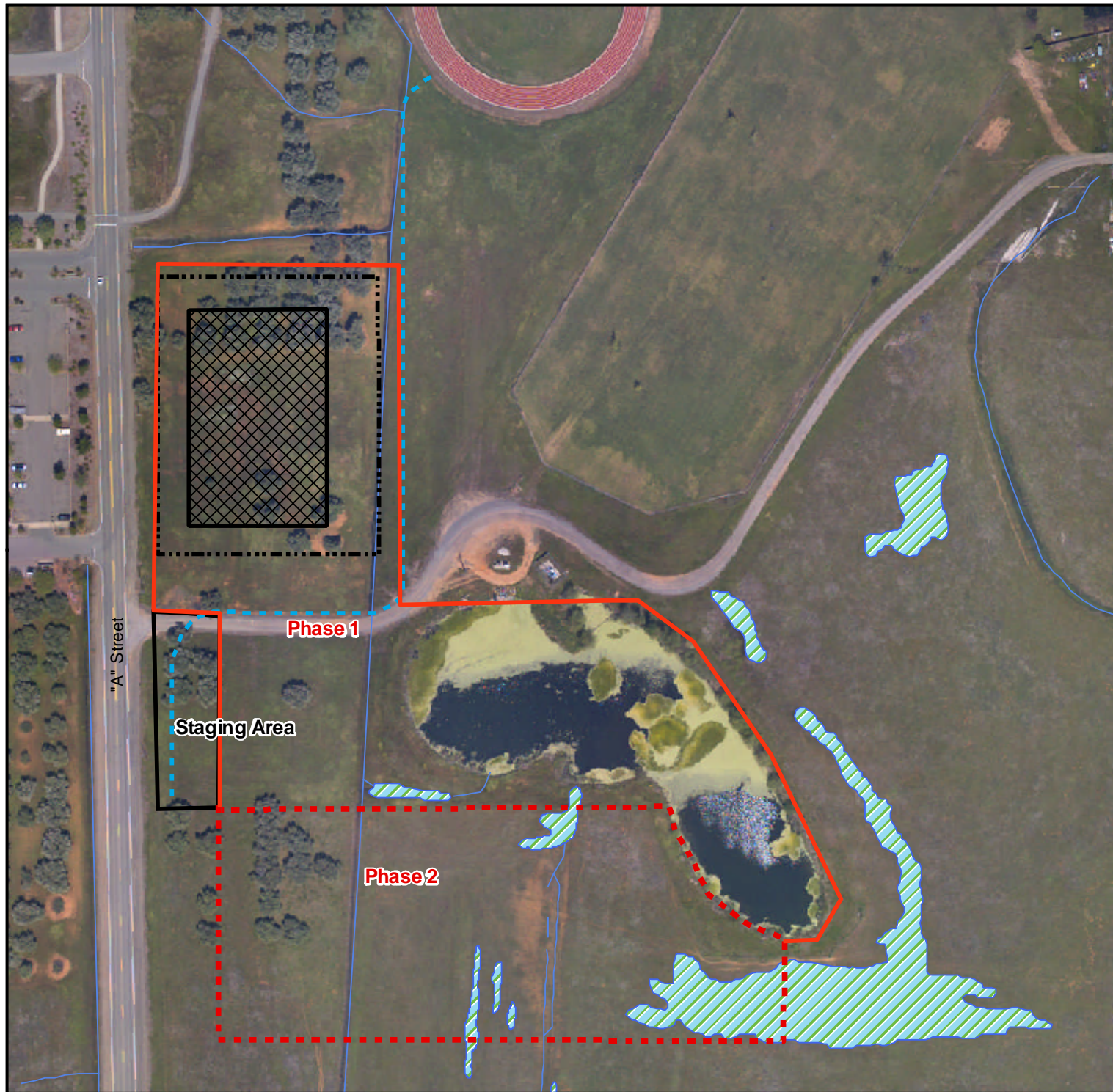
Phase 1 of the proposed project would also install a piping system from the A Street Pond to the Beale AFB baseball fields for irrigation (Figure 2-3). The pipeline would run north on A Street, west on 23rd Street, then north on C Street to the baseball fields. The trenching would be 3 to 4 feet deep and 2 to 3 feet wide.

Phase 2 of the proposed project would expand the southern edge of the A Street Pond and would increase the total capacity to 20-million gallons. The A Street Pond lies adjacent to grassland with wetlands present to the south and east and olive groves present to the west and northwest. Expansion of the A Street Pond would require removal of olive trees and rerouting a drainage ditch that currently runs north to south, between the pond and the borrow pit (Figure 2-2).









### Legend

- "A" St. Pond Phase 1
- - - "A" St. Pond Phase 2
- Berm
- - - Rerouted Drainage Ditch
- Drainages
- Bottom of Excavation
- Staging Area
- Wetlands and Swales



0 100 200 300  
Feet




Figure 2-2  
"A" Street Pond  
Beale Air Force Base  
"A" Street Pond  
Expansion Project EA  
Sep 2008





"A" Street

**Legend**

-  Irrigation Pipeline
-  Drainages
-  Wetlands and Swales

0 360 720 1,080  
Feet

**Figure 2-3**  
**"A" Street Pond**  
**Irrigation Pipeline**  
**Beale Air Force Base**  
**"A" Street Pond**  
**Expansion Project EA**  
**Sep 2008**

## **2.2 No Action Alternative**

Storage capacity of the A Street Pond would not be increased. Currently, the pond can provide up to 1 million gallons per day of water, sufficient for golf course irrigation but not for other locations on the installation.

## **2.3 Site Selection Criteria**

The site for the proposed A Street Pond expansion must meet several selection criteria for consideration:

- a) Site must be within a reasonable distance of existing WWTP lines (approximately 200 ft.) and in the Main Base area where the areas in need of irrigation are located.
- b) Site must be located in an area where the soil type does not promote seepage into the water table.
- c) Site must allow for future expansion of the holding pond.
- d) Site must minimize wetland impacts.

## **2.4 Other Alternatives Considered but Eliminated from Further Review**

Other alternatives, such as the selection of an alternate site for a new holding pond, were considered for the proposed action but these alternatives did not meet the site selection criteria. The current A Street Pond site is the only site available that is located within a reasonable distance of the existing WWTP lines and has a soil type appropriate for construction of a wastewater holding pond. The soils in other potential locations are Redding Corning Complex soils that have a severe rating for seepage, indicating the high risk of seepage into the water table (NRCS 2007).

## **2.5 Summary of Impacts and Environmental Protection Measures**

Table 2-1 presents a summary of the environmental impacts that may result from implementation of the Proposed Action. Table 2-2 presents cumulative effects. Table 2-3 presents the Environmental Protection Measures that Beale AFB and their contractors would comply with to minimize or eliminate impacts to environmental resources.

**Table 2-1. Summary of Environmental Impacts**

<b>Resource (Applicable Subchapter)</b>	<b>Proposed Action</b>	<b>No Action Alternative</b>
Air Quality (Subchapter 4.1)	Combustive emissions from construction equipment would be generated during construction. Fugitive dust would be generated from ground-disturbing activities such as site clearing, grading, and vehicular traffic moving over the disturbed site. However, these effects would not be substantial.	No change from the baseline condition as described in Subchapter 3.1.
Biological Resources (Subchapter 4.2)	<p>Vernal pools and seasonal wetlands occur within the Proposed Action area and approximately 0.223 acres (0.162 direct and 0.061 indirect) of vernal pools or seasonal wetlands may be impacted. To minimize or compensate for potential impacts associated with the Proposed Action, 0.446 acres of vernal pools or seasonal wetlands would be preserved and 0.162 acres would be restored on Beale AFB or at another wetland preservation bank approved by the USFWS. Beale AFB has completed consultation with the USFWS. The BO is located at Appendix B.</p> <p>By following the Environmental Preservation Measures in Table 2-3, no significant direct or indirect effects on special-status species or their habitat would result from implementation of the Proposed Action.</p>	No change from the baseline condition as described in Subchapter 3.2.
Water Resources (Subchapter 4.3)	<p>Clean Water Act permits have been submitted for Phase I, which would impact a total of 0.114 acres of jurisdictional waters of the U.S. Clean Water Act permits will be submitted for Phase II, which would impact a total of 1.844 acres of jurisdictional waters of the U.S.</p> <p>Land application of effluent would occur in the same manner as it is currently occurring at the golf course and the 40-acre spray field. The effluent would meet Waste Discharge Requirements prescribed by the Beale AFB Land Based Discharge National Pollutant Discharge Elimination System (NPDES) permit from the CRWQCB.</p> <p>The Proposed Action would minimally increase the impervious surface area and runoff on the installation. At the proposed project area, storm water runoff would flow into drainage systems that are of sufficient capacity. With adherence to best management practices (Table 2-3), adverse effects from erosion would be avoided.</p> <ul style="list-style-type: none"> <li>• The Proposed Action could impact about 0.4 and 3.9 acres of the 100- and 500-year floodplains, respectively. During construction,</li> </ul>	No significant changes to surface or groundwater would occur.

**Table 2-1. Summary of Environmental Impacts**

Resource (Applicable Subchapter)	Proposed Action	No Action Alternative
	<p>impacts would be minimized by using best management practices. In addition, the Proposed Action would be designed to allow adequate storm water drainage and free flow of water during rain events.</p> <ul style="list-style-type: none"> <li>• The Proposed Action would not adversely impact water resources at Beale AFB.</li> <li>•</li> </ul>	
Cultural Resources (Subchapter 4.4)	<p>The Proposed Action would involve ground disturbance during construction and may result in the inadvertent discovery of subsurface cultural materials. Damage to, or loss of any cultural artifacts, would be considered a significant impact. To avoid this impact, the Air Force will ensure that the best management practices (Table 2-3) for inadvertent discovery of cultural material is accomplished. Therefore, the Proposed Action would not adversely impact cultural resources.</p>	No change from the baseline condition as described in Subchapter 3.4.
Geological Resources (Subchapter 4.5)	<p>There would be no significant impacts on geological resources as a result of implementation of the Proposed Action. Construction at Beale AFB would occur within an area where the physiographic features and geologic resources have been, in part, disturbed and modified by prior construction. Impacts to physiography and geology would be minimal.</p> <ul style="list-style-type: none"> <li>• Earthwork at the project sites would be planned and conducted in such a manner as to minimize the duration of exposure of unprotected soils. The effects on soil erosion and sedimentation from construction activities are considered minor because erosion and sediment controls would be in place during construction to reduce and control siltation or erosion impacts to areas outside of the construction site. With incorporation of best management practices (Table 2-3), impacts to soils would not be considered significant.</li> </ul>	No change from the baseline condition as described in Subchapter 3.5.
Restoration, Hazardous Materials and Waste (Subchapter 4.6)	<p>There would be no significant impacts from hazardous materials and wastes management because of the Proposed Action. Minor hazardous materials and wastes would be generated during project construction. Although the proposed action is located within the administrative boundaries of two ERP sites, there is no contamination present on the project site.</p>	No change from the baseline condition as described in Subchapter 3.6.

**Table 2-1. Summary of Environmental Impacts**

<b>Resource (Applicable Subchapter)</b>	<b>Proposed Action</b>	<b>No Action Alternative</b>
Noise (Subchapter 4.7)	The Noise Element of the Yuba County General Plan has identified the recommended ambient allowable noise level for agricultural and low density residential land uses to be 50 dB at any time of day. The Proposed Action is not likely to generate excessive noise. The nearest sensitive noise receptor is over 2.5 miles from the project location. Therefore, the Proposed Action would not be expected to cause adverse noise impacts.	No change from the baseline condition as described in Subchapter 3.7.
Safety and Military Munitions Response Program (Subchapter 4.8)	Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not be expected to pose a safety risk to Base personnel or activities. The proposed construction projects would enable the Base to meet future mission objectives and conduct or meet mission requirements in a safe operating environment. During construction activities associated with the Proposed Action, construction crew workers would have a possibility of encountering unexploded ordnances or chemical agent identification sets. Contractors would be required to comply with the Environmental Protection Measures for the Military Munitions Response Program, thereby reducing impacts to less than significant.	No change from the baseline condition as described in Subchapter 3.8.
Transportation Resources (Subchapter 4.9)	Vehicles necessary for construction may have a minor adverse impact on Base roads. All road and lane closures would be coordinated with the Security Forces and would be temporary in nature; therefore, no significant adverse effects on transportation systems would be expected.	No change from the baseline condition as described in Subchapter 3.9.

AFB – Air Force Base  
dB–decibel  
ERP – Environmental Restoration Program  
BO – Biological Opinion

OSHA – Occupational Safety and Health Administration  
RWQCB – Regional Water Quality Control Board  
USACE – United States Army Corps of Engineers  
USFWS – United States Fish and Wildlife Service



**Table 2-2. Cumulative Effects on Resources**

<b>Resource</b>	<b>Past Actions</b>	<b>Current Background Activities</b>	<b>Proposed Action</b>	<b>Known Future Actions</b>	<b>Cumulative Effects</b>
<b>Air Quality</b>	Moderate transitional nonattainment area for O <sub>3</sub> and PM <sub>10</sub> .	Emissions from aircraft, vehicles, and stationary equipment.	Potential dust generation during soil removal, site grading, and construction.	Potential dust generation during soil removal, site grading, and construction.	Continued moderate transitional nonattainment area for O <sub>3</sub> and PM <sub>10</sub> . Actions would be <i>de minimus</i> . Effect not significant.
<b>Biological Resources</b>	Degraded historic habitat of sensitive and common wildlife species.	Beale AFB operations and development impact wildlife habitat.	Minor disturbance of vegetation by construction. Direct, indirect, and temporary effects on threatened and endangered species.	Minor disturbance of vegetation by construction. Direct, indirect, and temporary effects on threatened and endangered species.	Permanent loss of vegetation and low quality habitat. Direct and indirect effects on threatened and endangered species. Effects not significant.
<b>Cultural Resources</b>	Possible destruction of unknown artifacts.	Identification and recordation of historic and cultural resources.	Project could impact unknown historic archaeological sites.	Project could impact unknown historic archaeological sites.	Projects could impact unknown historic archaeological sites. Effect not significant.
<b>Geographical Resources</b>	Past Beale AFB development has modified soils.	Beale AFB development modifies soils.	Grading, excavation, and recontouring of the soil would result in further disturbance.	Grading, excavating, and recontouring of the soil would result in further soil disturbance.	Impacts would be permanent but localized. Effect not significant.

**Table 2-2. Cumulative Effects on Resources**

<b>Resource</b>	<b>Past Actions</b>	<b>Current Background Activities</b>	<b>Proposed Action</b>	<b>Known Future Actions</b>	<b>Cumulative Effects</b>
<b>Restoration, Hazardous Materials and Waste</b>	Mission operations created hazardous materials and waste. Identification and recordation of ERP sites and AOCs.	Mission operations create hazardous materials and waste. Identification and recordation of ERP sites and AOCs.	Construction activities would generate small amounts of hazardous materials and waste. Construction activities would be located within administrative boundaries of ERP site, but not on a contaminated site.	Construction activities would generate small amounts of hazardous materials and waste.	Small temporary increase in generation of hazardous materials and waste. Effect not significant.
<b>Noise</b>	Ambient noise on Beale AFB has generally been made up of wind and rustling vegetation, aircraft, and minor traffic.	Ambient noise on Beale AFB is generally made up of wind and rustling vegetation, aircraft, and minor traffic.	Temporary increase in noise during construction activities.	Temporary increase in noise during construction activities.	Periodic increases in noise levels from construction. Effect not significant.
<b>Safety</b>	Portions of the Base have been used as active ranges.	Identification and recordation of historic and active ranges.	Short-term effects on construction workers from construction activities and potential UXO. Not located on identified Munitions Response Areas.	Short-term effects on construction workers from construction activities and potential UXO.	Short-term effects on construction workers from construction activities and potential UXO. Effect not significant.



**Table 2-2. Cumulative Effects on Resources**

<b>Resource</b>	<b>Past Actions</b>	<b>Current Background Activities</b>	<b>Proposed Action</b>	<b>Known Future Actions</b>	<b>Cumulative Effects</b>
<b>Transportation</b>	Traffic infrastructure has been constructed on Base.	Traffic infrastructure currently has been constructed and maintained on the Base.	Short-term effects on traffic circulation and road closures from construction activities.	Short-term effects on traffic circulation and road closures from construction activities.	Short-term effects on traffic circulation and road closures from construction activities. Effects not significant.
<b>Water Resources</b>	Surface water quality moderately impacted by development.	Surface water quality moderately impacted by development.	Potential sedimentation from construction activities and minor increase in percentage of impervious surface area.	Potential sedimentation from construction activities and minor increase in percentage of impervious surface area.	Increased impervious area would have negligible effects on storm water discharges and water quality. Effect not significant.

**Table 2-3. Environmental Protection Measures**

Resource	Environmental Protection Measures
Air Quality	No environmental protection measures are required.
Biological Resources	<ul style="list-style-type: none"> <li>• Monitor Construction Activities. A qualified biologist from 9 CES/CEV would monitor all construction activities to ensure compliance with avoidance, minimization, and compensation components of the Proposed Action.  The biological monitor would assist construction personnel in compliance with all conservation measures and guidelines. The monitor would be responsible for directing the placement of all stakes, flags, and barriers protecting sensitive resources. The biological monitor would have the authority to stop construction activities if situations arise that could be detrimental to existing wetlands and would only allow construction to resume after corrective actions have alleviated the potential for detrimental activities.</li> <li>• Conduct Environmental Awareness Training. The biological monitor from 9 CES/CEV would conduct environmental awareness training for construction crews before and during project implementation. The education program would briefly cover threatened and endangered species and their habitats that might be encountered during construction or be within close proximity of the Proposed Action project sites. Awareness training would cover all restrictions and guidelines that must be followed by construction crews to avoid or minimize impacts on threatened and endangered species and their habitat. Environmental awareness training would be conducted prior to construction, when crews are about to enter potentially sensitive areas and when new personnel join the construction crews.  Restrictions and guidelines to be observed by construction crews include the following: <ul style="list-style-type: none"> <li>• Construction activities would only be allowed from May 1 to October 1.</li> <li>• All vehicle operators would observe the posted speed limit on paved roads and a 20-mile per hour speed limit on unpaved roads.</li> <li>• Off-road travel by vehicles or construction equipment would be prohibited outside of designated work areas.</li> <li>• No non-military firearms or pets would be allowed in the Proposed Action area.</li> <li>• Motor vehicles and equipment would be fueled and serviced in designated service areas.</li> <li>• Any worker who inadvertently kills or injures a special-status species, or finds one injured or trapped, would immediately report the incident to the biological monitor. The biological monitor would inform Environmental Flight (9 CES/CEV) who would verbally notify the USFWS Sacramento Endangered</li> </ul> </li> </ul>

**Table 2-3. Environmental Protection Measures**

Resource	Environmental Protection Measures
Biological Resources (Continued)	<p data-bbox="667 331 1308 390">Species Office within 3 days and would provide written notification of the incident within 5 days.</p> <ul style="list-style-type: none"> <li data-bbox="524 457 1390 848">• Stake and Flag Boundaries of Work Areas. Prior to construction, existing vernal pools will be marked on construction drawings. In the field, the contractor would provide all materials to stake and flag boundaries of the project work area. The contractor would coordinate with the biological monitor from 9 CES/CEV to stake and flag the boundaries of all work and staging areas in portions that have the potential to support vernal pool tadpole shrimp, fairy shrimp, or their habitat. Staking and flagging would be done before construction commences to ensure that construction vehicles, equipment, and personnel would not enter areas that have the potential to be occupied by vernal pool tadpole shrimp, fairy shrimp, or their habitat. The contractor would remove all stakes and flagging within 60 days of construction completion.</li> <li data-bbox="524 869 1360 1199">• Stake and Flag Boundaries of Adjacent Vernal Pools and Other Wetlands. Potential threatened and endangered species habitat adjacent to the construction area would be protected by the contractor by placing orange barrier material or stakes and flagging around the perimeter of the threatened and endangered species habitat in coordination with the biological monitor from 9 CES/CEV. The contractor would provide all materials to fence, stake, and flag boundaries of the adjacent vernal pools and other wetlands. The location of these barriers would be clearly marked on construction plans and their placement would be supervised by the biological monitor from 9 CES/CEV.</li> <li data-bbox="524 1220 1386 1434">• All construction staging activities would occur within a designated staging area, to be identified by the biological monitor. This site would be located no closer than 250 ft from any existing vernal pool, vernal swale, or other jurisdictional wetlands, and would be marked in the field and on the construction plans. Any spill of hazardous materials would be cleaned up immediately, in accordance with all Federal, state, and local regulations.</li> <li data-bbox="524 1455 1377 1604">• Disposal of Excavated Soil. All soil excavated during construction of projects occurring near vernal pool wetlands would be removed and disposed of outside the project area by the contractor. Coordination with 9 CES/CEV and appropriate regulatory requirements is required prior to disposing of this excavated soil.</li> <li data-bbox="524 1625 1386 1864">• Soil stockpile locations would be placed more than 250 ft from existing wetlands that are not designated for encroachment. Careful application of water to the stockpile's soils will reduce the potential for air quality contamination by fugitive dust. Watering of other exposed soils related to construction activities would be necessary for dust control and soil compaction. Water application would be directed away from existing vernal pools to avoid triggering vernal pool species growth outside of the normal growing season.</li> </ul>

**Table 2-3. Environmental Protection Measures**

Resource	Environmental Protection Measures
Biological Resources (Continued)	<ul style="list-style-type: none"> <li>• Compensation for Direct and Indirect Impacts <b>on Vernal Pool Wetlands</b>. The project proponent should avoid, minimize, or compensate for project-related impacts on vernal pool wetlands. According to the Beale AFB Habitat Management Plan, projects must compensate for adverse effects on the habitat of listed vernal pool invertebrates by preserving unaffected habitat and restoring new habitat that is eliminated as a result of the Proposed Action (BAFB 2002). <ul style="list-style-type: none"> <li>• For every acre of habitat directly affected by the Proposed Action, 2 acres of vernal pool wetlands (branchiopod habitat) would be preserved and 1 acre would be restored on Beale AFB or at another ecosystem preservation bank approved by the USFWS.</li> <li>• For every acre of vernal pool wetlands indirectly affected by the Proposed Action, 2 acres of similar branchiopod habitat would be preserved on Beale AFB or at another ecosystem preservation bank approved by the USFWS.</li> </ul> </li> </ul> <p>Because of water flows and the presence of vertebrate and invertebrate predators, all other type of waters of the U.S. would not likely provide habitat for the vernal pool tadpole and fairy shrimp. Therefore, measures to minimize or compensate for impacts on these wetland types have not been proposed.</p>
Water Resources	<ul style="list-style-type: none"> <li>• Best Management Practices. The contractor would adhere to best management practices and applicable codes and ordinances to reduce storm water runoff-related impacts to a level of insignificance. The following best management practices would be followed by the contractor prior to and during construction activities: <ul style="list-style-type: none"> <li>• Construction activities would only be allowed from May 1 to October 1.</li> <li>• Erosion and sediment controls would be in place during construction to reduce and control siltation or erosion impacts on areas outside of the proposed construction sites.</li> <li>• All vehicle operators would observe the posted speed limit on paved roads and a 20-mile per hour speed limit on unpaved roads.</li> <li>• Off-road travel by vehicles or construction equipment would be prohibited outside of designated work areas.</li> <li>• Motor vehicles and equipment would be fueled and serviced in designated service areas.</li> </ul> </li> <li>• Disposal of Excavated Soil. All soil excavated during construction of projects occurring in jurisdictional waters of the U.S. would be removed and disposed of by the contractor outside the project area.</li> </ul>

### Table 2-3. Environmental Protection Measures

Resource	Environmental Protection Measures
	Coordination with 9 CES/CEV is required prior to disposing of this excavated soil.
Cultural Resources	<ul style="list-style-type: none"> <li>Cultural Resources Awareness Training. All construction and maintenance personnel would receive cultural resources awareness training by 9 CES/CEV regarding the appropriate work practices necessary to effectively protect cultural resources. This training would address Federal, state, and local laws regarding cultural resources; the importance of these resources and the purpose and necessity of protecting them; and the appropriate methods for reporting and protecting inadvertently discovered cultural resources.</li> <li><i>Inadvertent Discovery of Archaeological Resources.</i> The following procedure applies to the inadvertent discovery of archaeological remains during ground disturbing activities at the installation. This procedure does not apply to cultural resources studies or archaeological research projects contracted or permitted by USAF. <i>Any unknown site or other cultural remains inadvertently discovered <u>must</u> be assumed to be potentially eligible for the NRHP listing and afforded appropriate protection until it is determined to be otherwise.</i></li> </ul>
Cultural Resources (Continued)	<ul style="list-style-type: none"> <li>Stop work and notify the installation's Cultural Resources Manager. In the event that human remains, artifacts, or other archaeological materials are discovered during the course of any action, project, or activity at Beale AFB, all ground disturbing activity at the point of discovery, plus a reasonable buffer exclusionary area, <b>MUST BE HALTED</b> and the CRM notified.</li> </ul>
Geological Resources	<ul style="list-style-type: none"> <li>Fugitive dust from construction activities would be minimized by watering and soil stockpiling, thereby reducing to negligible levels the total amount of soil exposed. Standard erosion control means (silt fencing, sediment traps, application of water sprays, and revegetation at disturbed areas) would also reduce environmental consequences related to those characteristics.</li> </ul>
Restoration, Hazardous Materials and Waste	<ul style="list-style-type: none"> <li>Because of the potential for construction workers to be exposed to contamination from ERP sites during construction, it is recommended that a health and safety plan be prepared by the contractor in accordance with OSHA requirements prior to commencement of construction or burning activities on ERP sites. Should contamination be encountered, handling, storage, transportation, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations; AFIs; and Beale AFB programs and procedures. Workers at the ERP sites listed above should either have OSHA 40-hour Hazardous Waste Operations and Emergency Response training, or a supervisor should have OSHA Site</li> </ul>

**Table 2-3. Environmental Protection Measures**

Resource	Environmental Protection Measures
	Supervisor certification. Current site-specific information about contamination, UST sites, and ERP infrastructure on and around each project site should be obtained prior to construction or burning and site-specific health and safety plans should be prepared. Project planning should include protection of ERP infrastructure such as monitoring wells, treatment systems, and conveyance pipes to avoid disruption of clean-up activities. Prior to the initiation of a project on any environmental restoration site a waiver must be submitted to HQ ACC/A7A for approval.
Noise	No environmental protection measures are required.
Safety and Military Munitions Response Program	<ul style="list-style-type: none"><li>All non-intrusive work shall be coordinated with the Base Environmental Office and shall be approved by SE before any project starts. For all intrusive work an ESS Report shall be prepared and coordinated through the Base Environmental Office to Wing Safety to HQ ACC/Safety to AF/Safety Center/Weapons Safety Division to DoD/Explosive Safety Board for final approval.</li></ul>
Transportation Resources	No environmental protection measures are required.

9 CES/CEV – 9<sup>th</sup> Civil Engineering Squadron/Environmental Flight  
AF – Air Force  
AFB – Air Force Base  
DoD – Department of Defense  
ERP – Environmental Restoration Program  
ESS – Explosive Safety Submission

HQ ACC – Headquarters Air Combat Command  
SE – Wing Safety  
USAF – U.S. Air Force  
USFWS – United States Fish and Wildlife Service  
UST – underground storage tank

### 3.0 Affected Environment

Section 3.0 describes the environmental resources and conditions most likely to be affected by the Proposed Action. This section provides information to serve as a baseline from which to identify and evaluate environmental changes likely to result from implementation of the Proposed Action. Baseline conditions represent current conditions. The potential environmental impacts of the Proposed Action and No Action Alternative on the baseline conditions are described in Section 4.0.

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, as amended, the description of the affected environment focuses on those resources and conditions potentially subject to impacts including air quality, biological resources, cultural resources, geological resources, hazardous materials and waste management, noise, safety and military munitions, transportation resources, and water resources. Some environmental resources were assessed that, in accordance with Council on Environmental Quality guidelines, warrant no further analysis in this EA:

- **Land Use.** All activities associated with the Proposed Action would be consistent with present and foreseeable land use patterns at Beale AFB. Implementation of the Proposed Action would not significantly alter the existing land use at Beale AFB. Accordingly, this resource area was not analyzed in detail.
- **Socioeconomics.** The Proposed Action does not involve any activities that would directly affect off-Base activities, or directly or indirectly contribute to changes in socioeconomic resources. There would be no change in the number of personnel assigned to Beale AFB and no changes in area population or associated changes in demand for housing and services. Accordingly, this resource area was not analyzed in detail.
- **Environmental Justice.** The Proposed Action does not involve any activities that would contribute to adverse impacts to low-income or minority populations because all work would be performed within the Base boundary. Accordingly, this resource area was not analyzed in detail.

#### 3.1 Air Quality

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. National Ambient Air Quality Standards (NAAQS) are established by the U.S. Environmental Protection Agency (USEPA) for “criteria pollutants,” including ozone (O<sub>3</sub>), carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter equal to or less than 10 microns in diameter (PM<sub>10</sub>), particulate matter equal to or less than 2.5 microns in diameter (PM<sub>2.5</sub>), and lead (Pb). NAAQS represent maximum levels of background pollution in the ambient air that are considered safe, with an adequate margin of safety to protect public health and welfare (Table 3-1).

**Table 3-1. National and California Ambient Air Quality Standards**

Measurement	Standard Value	Standard Type
<b>CO</b>		
8-hour Average	9 ppm (10 mg/m <sup>3</sup> )	National Primary and CAAQS
1-hour Average	35 ppm (40 mg/m <sup>3</sup> )	National Primary
1-hour Average	20 ppm (23 mg/m <sup>3</sup> )	CAAQS
<b>NO<sub>2</sub></b>		
Annual Arithmetic Mean	0.053 ppm (100 µg/m <sup>3</sup> )	National Primary and Secondary
Annual Arithmetic Mean	0.030 ppm (56 µg/m <sup>3</sup> )	CAAQS
1-hour Average	0.18 ppm (338 µg/m <sup>3</sup> )	CAAQS
<b>O<sub>3</sub></b>		
8-hour Average	0.08 ppm (157 µg/m <sup>3</sup> )	National Primary and Secondary
8-hour Average	0.070 ppm (137 µg/m <sup>3</sup> )	CAAQS
1-hour Average	0.09 ppm (180 µg/m <sup>3</sup> )	CAAQS
<b>Pb</b>		
Quarterly Average	1.5 µg/m <sup>3</sup>	National Primary and Secondary
Monthly Average	1.5 µg/m <sup>3</sup>	CAAQS
<b>PM<sub>10</sub></b>		
24-hour Average	150 µg/m <sup>3</sup>	National Primary and Secondary
Annual Arithmetic Mean	20 µg/m <sup>3</sup>	CAAQS
24-hour Average	50 µg/m <sup>3</sup>	CAAQS
<b>PM<sub>2.5</sub></b>		
Annual Arithmetic Mean	15 µg/m <sup>3</sup>	National Primary and Secondary
Annual Arithmetic Mean	12 µg/m <sup>3</sup>	CAAQS
24-hour Average	35 µg/m <sup>3</sup>	National Primary and Secondary and CAAQS
<b>SO<sub>2</sub></b>		
Annual Arithmetic Mean	0.030 ppm (80 µg/m <sup>3</sup> )	National Primary
24-hour Average	0.14 ppm (365 µg/m <sup>3</sup> )	National Primary
3-hour Average	0.50 ppm (1,300 µg/m <sup>3</sup> )	National Secondary
1-hour Average	0.25 ppm (655 µg/m <sup>3</sup> )	CAAQS
24-hour Average	0.04 ppm (105 µg/m <sup>3</sup> )	CAAQS

Source: California Air Resources Board 2007

Notes: Concentration expressed first in units in which it was promulgated. Equivalent concentrations are given in parentheses.

CAAQS - California Ambient Air Quality Standards

CO - Carbon monoxide

NAAQS - National Ambient Air Quality Standards

NO<sub>2</sub> - Nitrogen dioxide

O<sub>3</sub> - Ozone

PM<sub>2.5</sub> - Particulate matter less than or equal to 2.5 microns in diameter

PM<sub>10</sub> - Particulate matter less than or equal to 10 microns in diameter

Pb - Lead

SO<sub>2</sub> - Sulfur dioxide

ppm - parts per million

mg/m<sup>3</sup> - milligrams per cubic meter

µg/m<sup>3</sup> - micrograms per cubic meter

The State of California adopted the NAAQS and promulgated additional California Ambient Air Quality Standards (CAAQS) for criteria pollutants. The California standards are more stringent than the Federal primary standards. Table 3-1 presents the primary and secondary NAAQS and CAAQS that apply to air quality in California.

Under the General Conformity Rule, the Clean Air Act (CAA) prohibits Federal agencies from performing projects that do not conform to a USEPA-approved State



Implementation Plan (SIP). In 1993, USEPA developed final rules for how Federal agencies must determine air quality conformity prior to implementing a proposed Federal action. Under these rules, certain actions are exempt from conformity determinations, while others are assumed to be in conformity if total project emissions are below *de minimis* levels established under 40 CFR 93.153. Total project emissions include both direct and indirect emissions caused by the Federal action.

USEPA classifies the air quality in an air quality control region (AQCR) or in subareas of an AQCR according to whether the concentration of criteria pollutants in ambient air exceeds the primary or secondary NAAQS. All areas within each AQCR are therefore designated as either “attainment,” “nonattainment,” or “unclassified” for each of the six criteria pollutants. Attainment means that the air quality within an AQCR is less than the NAAQS, nonattainment indicates that air quality exceeds the NAAQS, and an unclassifiable air quality designation by USEPA means that there is not enough information to appropriately classify an AQCR; therefore, the area is considered in attainment.

The General Conformity Rule requires that any Federal action meet the requirements of a SIP or Federal Implementation Plan (FIP). More specifically, CAA conformity is assured when a Federal action does not cause a new violation of the NAAQS, contribute to an increase in the frequency or severity of violations of NAAQS, or delay the timely attainment of any NAAQS, interim progress milestones, or other milestones toward achieving compliance with the NAAQS. The General Conformity Rule applies only to actions in nonattainment or maintenance areas and considers both direct and indirect emissions.

The California Air Resources Board (CARB), under the Health and Safety Code section 39607(e), is required to establish and periodically review area designation criteria. These designation criteria provide the basis for CARB to designate areas of California as attainment, nonattainment, or unclassified for the State standards. Each year, CARB reviews the area designations and updates them as appropriate, based on the three most recent complete and validated calendar years of air quality data.

Beale AFB is located in Yuba County, which is within the Sacramento Valley Intrastate AQCR. The Feather River Air Quality Management District (FRAQMD) is responsible for implementing and enforcing state and Federal air quality regulations in Yuba County, Sutter County, and portions of the Northern Sacramento Valley Air Basin. Table 3-2 presents the attainment designations for the project area. The Federal O<sub>3</sub> attainment status for FRAQMD has been characterized by USEPA as unclassified/attainment for Yuba County. The Federal attainment status for FRAQMD has been characterized as unclassified/attainment for all other criteria pollutants (USEPA 2005). The state attainment status for FRAQMD has been characterized by CARB as a nonattainment area for O<sub>3</sub> and for PM<sub>10</sub>, and unclassifiable or attainment for all other criteria pollutants (CARB 2006).

**Table 3-2. Project Region (FRAQMD, Yuba County) Attainment Designations**

<b>Pollutant</b>	<b>State Standards (CAAQS)</b>	<b>Federal Standards (NAAQS)</b>
Ozone (O <sub>3</sub> )	Nonattainment	Unclassified <sup>a</sup> /Attainment
Carbon Monoxide (CO)	Unclassified <sup>a</sup>	Unclassified <sup>a</sup> /Attainment
Nitrogen Dioxide (NO <sub>2</sub> )	Attainment	Unclassified <sup>a</sup> /Attainment
PM <sub>10</sub>	Nonattainment	Unclassified <sup>a</sup> /Attainment
PM <sub>2.5</sub>	Unclassified <sup>a</sup>	Unclassified <sup>a</sup> /Attainment

<sup>a</sup>Unclassified means that there is insufficient data to determine attainment status

Source CARB 2006, USEPA 2005

## 3.2 Biological Resources

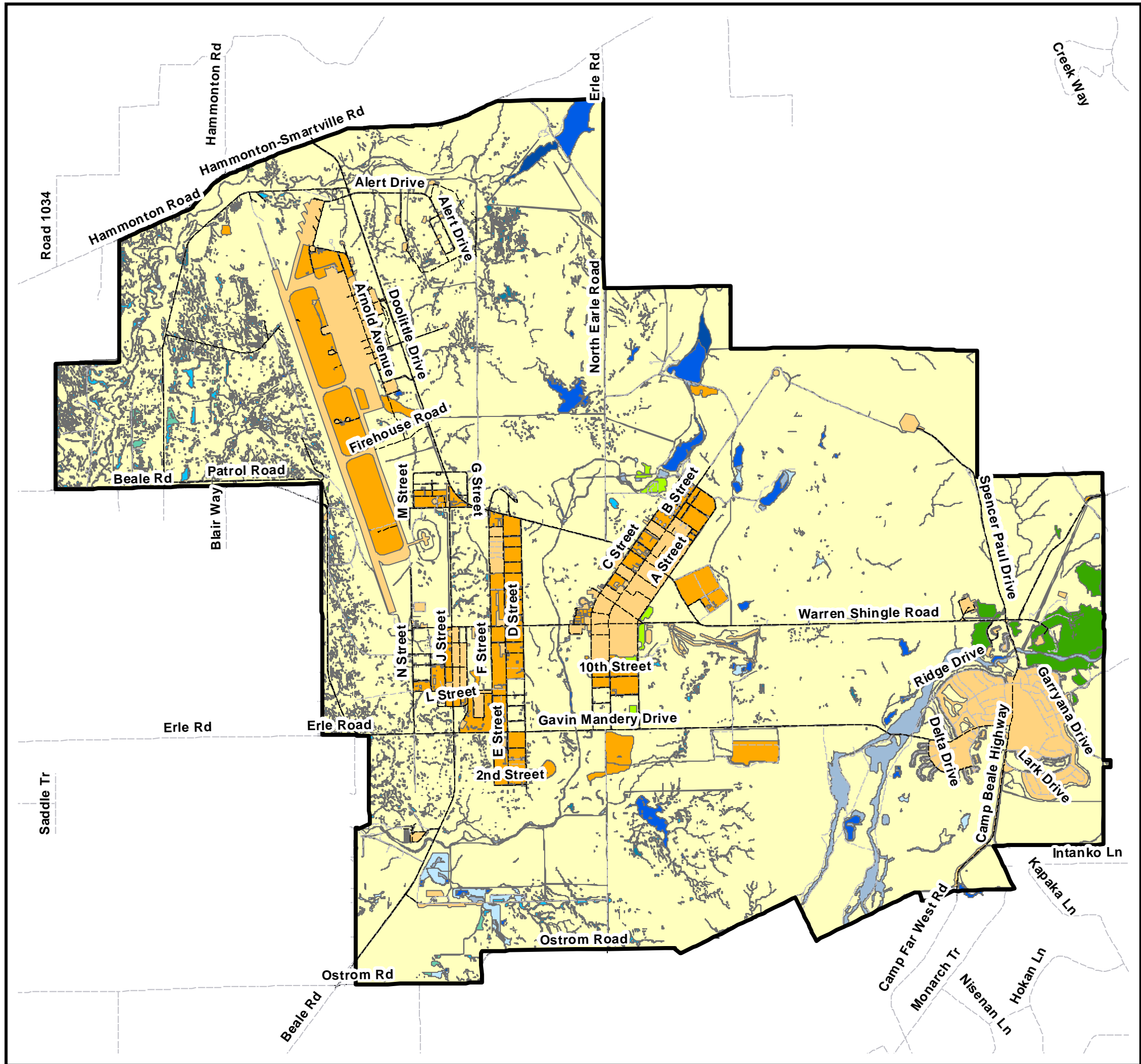
Biological resources include native or naturalized plants and animals and the habitats (i.e., wetlands, forests, and grasslands) in which they exist. Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS). Habitat communities on Beale AFB are shown in Figure 3-1.

This section describes the following aspects of the affected environment:

- Annual grasslands
- Wetland resources
- Special-status species

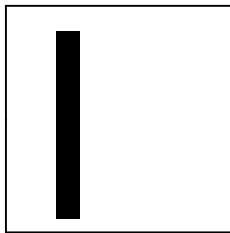
Information in this section is based on site visits from December 2006 to March 2007, Beale INRMP (BAFB 2005), a search of the California Department of Fish and Game's California Natural Diversity Database (CNDDB), previous environmental documents completed for the project areas, and the following wetland delineations:

- *Delineation of waters of the United States for Areas Potentially Included in the Habitat Conservation and Management Plan for Beale Air Force Base* (Jones & Stokes 2001).
- *Beale Air Force Base Anti-Terrorism/Force Protection Upgrades Wetland Delineation Report* (Foothill 2004).
- *Wing Infrastructure Development Outlook Wetland Delineation Report* (e2M 2005).
- *Beale Air Force Base Supplemental Wetland Delineation* (Wildlands 2005).
- *Beale Air Force Base Wetland Delineation* (USACE 2007).



## Legend

- Installation Boundary
- DEVELOPED
- DISTURBED GROUND
- DISTURBED SEASONAL WETLAND
- GRASSLAND
- OAK WOODLAND
- OPEN WATER AND PERENNIAL DRAINAGE
- ORCHARDS AND EUCALYPTUS STANDS
- OTHER SEASONAL WETLAND
- PERMANENT MARSH
- RIPARIAN WETLANDS
- SEASONAL SWALE
- VERNAL POOL



0 0.5 1 2 Miles

Figure 3-1  
Habitat Communities  
Beale Air Force Base  
"A" Street Pond  
Expansion Project EA  
Sep 2008

### 3.2.1 Annual Grasslands

Annual grassland is an upland plant community (habitat) dominated by nonnative grasses, but containing a diverse assemblage of native and nonnative forbs. Vegetation in the annual grassland is dominated by species that are rarely found in wetlands.

A portion of the Proposed Action would occur in annual grasslands. Most of the annual grasslands affected by the Proposed Action are previously disturbed and dominated by ruderal vegetation. The lower species diversity common in ruderal habitat generally provides less value to wildlife than the higher species diversity found in native annual grassland habitat. Scattered native wildflower species that represent remnants of the original vegetation are also present in less disturbed sites.

Annual grasslands at Beale AFB provide foraging habitat and cover to numerous locally and regionally common wildlife species. The majority of annual grasslands that would be affected by the Proposed Action have been subject to disturbances from human activity.

### 3.2.2 Wetland Resources

Vernal pools on Beale AFB are classified as Northern Hardpan Vernal Pools (Sawyer and Keeler-Wolf 1995). Northern Hardpan Vernal Pools are an aggregate vegetation community that includes vernal pools, vernal swale wetlands, and depressional seasonal wetlands. Vernal pools are small, shallow, seasonal bodies of water formed by precipitation accumulating in depressions over an impervious claypan or bedrock bottom. They provide unique habitat for plants that germinate as aquatic or semiaquatic plants but must adapt to terrestrial life and a dry land environment as the pool dries.

The dominant vegetation species in typical vernal pools at Beale AFB are coyote thistle (*Eryngium vaseyi*), Fremont goldfields (*Lasthenia fremontii*), white-flowered navarretia (*Navarretia leucocephala*), annual hairgrass (*Deschampsia danthonioides*), field owl's-clover (*Castilleja campestris*), woolly marbles (*Psilocarphus brevissimus*), and ornate downingia (*Downingia ornatissima*). Vegetation in vernal pools is dominated by species that are usually found in wetlands (BAFB 2001).

Disturbed seasonal wetlands are wet areas that have been degraded by human or livestock activities, such as clearing, grading, trampling, or grazing. The disturbed seasonal wetlands in the study area are not natural features, but were formed by grading activities that created depressions. Because these are recently formed features, the vegetation may be similar to that of vernal pools. However, the diversity and cover of vernal pool species in the disturbed areas are lower than in natural vernal pools, and the cover of nonnative disturbance-tolerant species is higher.

Seasonal wetlands, including vernal pools, at Beale AFB provide important foraging and breeding habitat and cover for wetland wildlife and invertebrates. The high densities of terrestrial and aquatic invertebrates (i.e., ostracods, copepods, flatworms, and mosquito larvae) in wetland habitats provide an abundance of food for wildlife. Many wildlife species, including killdeer (*Charadrius vociferous*) and Pacific tree frogs (*Pseudacris regilla*), feed on the aquatic invertebrates found in seasonal wetlands. Many other wildlife species feed in or adjacent to wetlands; these species include western kingbirds

(*Tyrannus verticalis*), cliff swallows (*Hirundo pyrrhonota*), barn swallows (*H. rustica*), red-winged blackbirds (*Agelaius phoeniceus*), and common kingsnakes (*Lampropertis getulus*) (BAFB 1999). Wetlands provide potential habitat for several special-status species listed in Section 3.2.3.

Other seasonal wetlands occur in topographic low areas or depressions. While they might be associated with riverine systems (either tributary to or interspersed within riverine features), at some point or points during the rainy season their hydrology is dominated by still water.

The vernal pools and other seasonal wetlands identified within or adjacent to the Proposed Action were determined using site visits, and existing Beale AFB delineations and LiDAR data. The wetlands that occur on Beale AFB are found predominantly in the western, central, and southern portions of the Base. Portions of the A Street Pond Expansion would be located in or near vernal pools and/or other seasonal wetlands.

### 3.2.3 Special-Status Species

#### Vegetation

Six plant species formally protected under Federal or state law are or potentially could be found in Yuba County: Hartweg's golden sunburst (*Pseudobahia bahiifolia*), hairy Orcutt grass (*Orcuttia pilosa*), Hoover's spurge (*Chamaesyce hooveri*), Greene's tuctoria (*Tuctoria greene*), Sacramento Orcutt grass (*Orcuttia viscida*), and slender Orcutt grass (*Orcuttia tenuis*). None of these species have been observed on Beale AFB.

#### Animals

There are 14 animal species formally protected under Federal or state law that are or potentially could be found in Yuba County. Several of those species occur in the vicinity of the Proposed Action.

- The federally protected vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardii*) habitat occurs at Beale AFB.
- The federally protected Central Valley steelhead (*Oncorhynchus mykiss*) and Chinook salmon (*Oncorhynchus tshawytscha*) habitat occurs in Dry Creek upstream from Beale AFB.
- The state-protected California black rail (*Laterallus jamaicensis coturniculus*) was observed in a marsh below Miller Lake and at PAVEPAWS Lake.
- The state-protected bald eagle (*Haliaeetus leucocephalus*) is an irregular migrant to the area, and considered to use the Base for occasional foraging.
- The state-protected white-tailed kite (*Elanus leucurus*), present on the Base year-round, is considered to use the project site for occasional foraging.
- The state-protected golden eagle (*Aquila chrysaetos*), a year-round visitor to the Base, is considered to use the project site for occasional foraging.
- The state-protected American peregrine falcon (*Falco peregrinus anatum*), an irregular visitor to the Base, is considered to use the project site for occasional foraging.

- The state-protected Swainson's hawk (*Buteo swainsoni*) and greater sandhill crane (*Grus canadensis tabida*) have not been observed at the project site.
- In addition, many bird species present at the project site (including those identified above) are subject to regulation under the Migratory Bird Treaty Act.

### 3.3 Water Resources

Water resources include surface water, groundwater, and floodplains. This evaluation identifies the quantity and quality of the resource and its demand for potable, irrigation, and industrial purposes. Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Groundwater typically can be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate. Floodplains are areas of low-level ground present along a river or stream channel. Federal, state, and local regulations often limit floodplain development to passive uses such as recreation and preservation activities to reduce the risks to human health and safety.

#### 3.3.1 Surface Water

Several lakes and small impoundments are located on Beale AFB, and three major drainage channels (Dry, Hutchinson, and Reeds creeks) cross the Base in a generally northeast-to-southwest direction.

#### 3.3.2 Jurisdictional Waters of the United States

Those areas that convey water, exhibit an "ordinary high water mark," and do not meet the three parameter criteria for wetlands, might be non-wetland waters of the U.S. An ordinary high water mark is defined as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, or the presence of litter and debris (33 CFR 328.3). This range of jurisdiction is typically regarded as the limit of the 2-year storm (a 50 percent probability that the line will be reached during the rainy season) (Foothill 2004).

The USACE recognizes three distinct types of drainage features: ephemeral drainages, intermittent drainages, and perennial drainages. Ephemeral drainages are fed primarily by storm water. They convey flows during and immediately after storm events; however, they may stop flowing or begin to dry if the interval between storms is sufficiently long. Intermittent drainages are fed primarily by groundwater and supplemented by storm water. After the onset of rains they should have persistent flows throughout and past the end of the rainy season. Eventually, depending on the availability of groundwater, these features become dry. Perennial drainages are fed predominantly by groundwater and supplemented by storm water. Flows in these systems persist throughout the year (Foothill 2004).

Jurisdictional waters of the U.S., including seasonal wetlands and small drainages, that may be impacted by the Proposed Action occur in portions of the A Street Pond project area.

### 3.3.3 Groundwater

Yuba County lies over the north-central portion of the Central Valley groundwater basin, which is an extensive aquifer extending approximately 400 miles from Red Bluff to Bakersfield and averaging 40 miles wide. This aquifer is a complex system of different groundwater basins composed of stratified sand, silt, and clay layers many thousands of feet thick. Groundwater at Beale AFB that belongs to this regional groundwater basin is found 300 to 500 feet below ground surface (bgs) and is presumed to originate in unconfined aquifer materials with local clay/silt lenses overlying the Central Valley groundwater basin. Groundwater in the northern portion of the Base receives recharge from the Yuba River drainage basin and generally has the highest quality at the Base, with low levels of total dissolved solids, nitrates, and sulfates; groundwater in the central portion of the Base has higher levels of total dissolved solids; and groundwater at the south end of the Base receives recharge from Dry Creek and Bear River and has quality between that of the north and central regions.

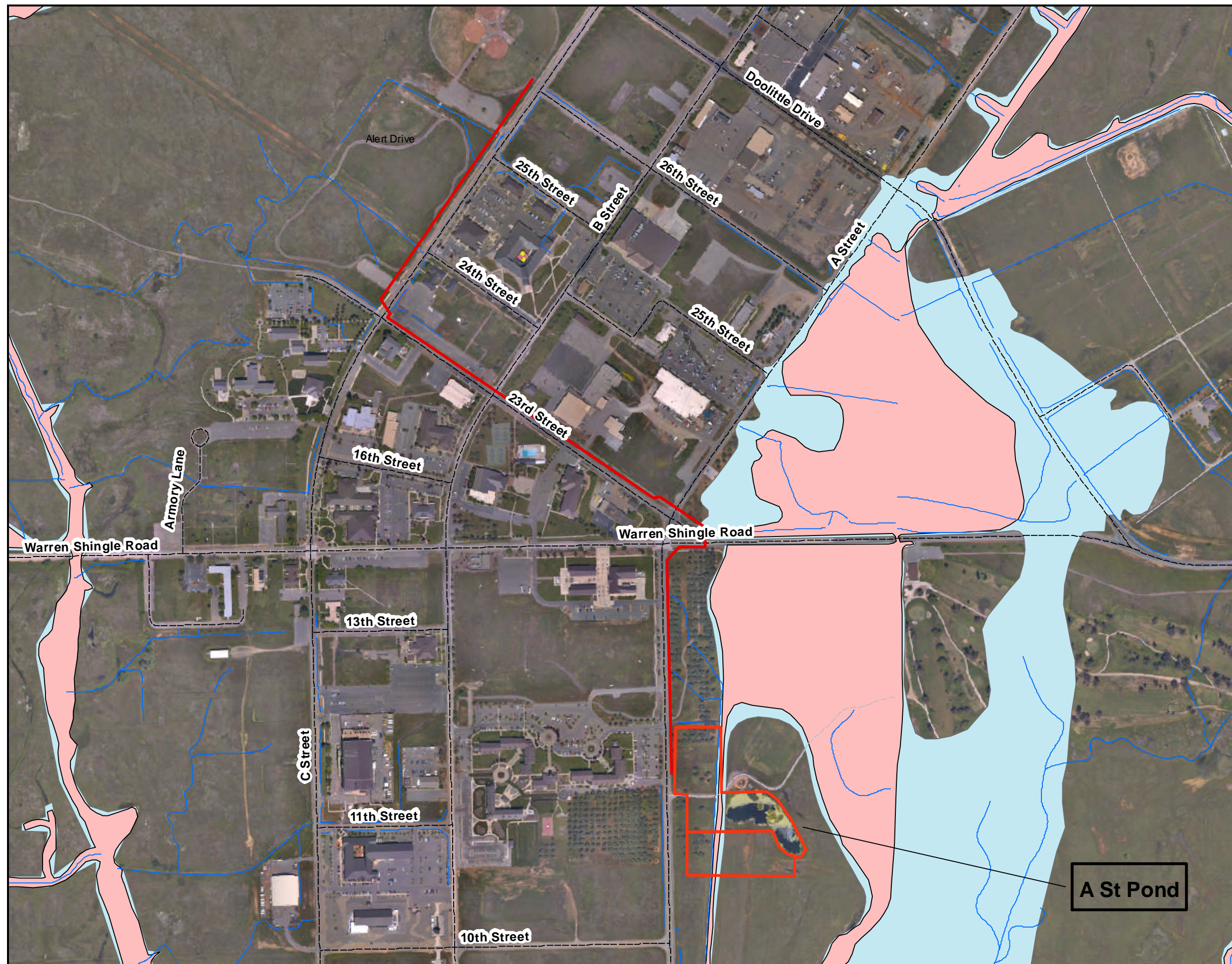
Groundwater at Beale AFB is generally first encountered within about 4 to 100 feet bgs at monitoring wells throughout the Base (CH2M Hill 2007a). Groundwater has been impacted by former Base activities and is monitored and sampled under the ERP program. Groundwater elevations are measured and samples are analyzed for chemicals that have historically been detected at ERP sites. Groundwater at Beale AFB mainly flows to the west, toward a large regional water table depression caused by historical agricultural pumping. Agricultural pumping has declined but the regional depression remains. The water table has risen in recent years because farmers are relying on imported irrigation water. Trichloroethene (TCE), the most commonly detected contaminant at Beale AFB, and other chemicals found in groundwater are presented in the 2006 Annual Basewide Groundwater Monitoring Program Report (CH2M Hill 2007a).

Water for domestic use at Beale AFB is provided from nine deep wells on the Base. Total water use at the Base varies from 2.5 to 6.0 million gallons per day. The wells have a total combined pumping capacity of 5.0 million gallons per day. Water quality meets primary drinking water standards, but not secondary water quality standards for iron and manganese and is treated by chlorination and fluoridation (BAFB 1999).

### 3.3.4 Floodplains

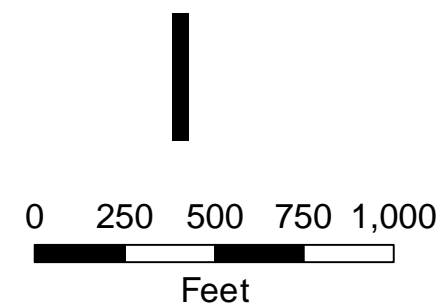
Creeks at Beale AFB are surrounded by wide floodplain areas created by the occasional heavy rainfall that occurs in the region, impervious soil conditions, and lack of topographic relief. There are two types of floodplains: (1) the 100-year floodplain has a 1 percent chance of flooding in any given year and (2) the 500-year floodplain has a 0.2 percent chance of flooding in any given year. This likelihood of occurrence is based on historic hydrology; future flood flows may be more or less frequent. The location of the 100- and 500-year floodplain at Beale AFB is shown in Figure 3-2. Various areas along major drainages at Beale AFB (Dry, Reeds, and Hutchinson creeks; and Best Slough) are within the 100-year floodplain. These floodplains flood periodically to varying degrees. Portions of the flightline, cantonment, military family housing, and riparian areas are within these floodplains (BAFB 1999). The A Street Pond project site is within the 100- and 500-year floodplain.





**Legend**

- Installation Boundary
- "A" Street Pond Project
- Drainages and Swales
- 100-Year Floodplain
- 500-Year Floodplain



**Figure 3-2**  
Major Surface Waters  
100-and 500-Year Floodplains  
Beale Air Force Base  
"A" Street Pond  
Expansion Project EA  
Sep 2008



### 3.4 Cultural Resources

Cultural resources are aspects of the physical environment that relate to human culture and society and cultural institutions that hold communities together and link them to their surroundings. Cultural resources include expressions of human culture and history in the physical environment (such as prehistoric and historic sites, buildings, structures, objects, districts, and other places, including natural features) considered to be important to a culture, subculture, or community. Cultural resources also include traditional life ways and practices, community values, and institutions.

Cultural resources consist of prehistoric and historic artifacts, archaeological sites, districts, structures, or any other physical evidence of previous human activities that are part of the current landscape. The three primary categories of cultural resources that are addressed by Federal regulations regarding the protection and preservation of cultural resources on Federal property are (1) archaeological sites (typically subsurface deposits), (2) architectural resources (standing structures and buildings), and (3) Traditional Cultural Properties (TCP) (landscapes determined to be important to a particular culture or group). For undertakings on Federal property, cultural resource impact assessment is in accordance with the National Historic Preservation Act of 1966 (NHPA); and 36 CFR Part 800, Protection of Historic and Cultural Properties.

As part of the EA process, the NHPA requires an assessment of potential impacts on cultural resources and the potential for adverse effects on historic properties associated with proposed undertakings located on Federal property or to be completed with Federal funds. Historic properties are cultural resources that have been listed or evaluated and determined to be eligible for listing on the National Register of Historic Places (NRHP). Eligibility for nomination to the NRHP is determined by a cultural resource's ability to satisfy the eligibility criteria defined in 36 CFR 60.4. Cultural resources that have not been evaluated for NHRP eligibility are considered eligible for compliance purposes until such evaluation has been completed and a determination of eligibility is made. In accordance with EO 12372, *Intergovernmental Review of Federal Programs*, and requirements of the Beale AFB Integrated Cultural Resources Management Plan (ICRMP) (BAFB 2008a), Section 106 consultation would be initiated with the State Historic Preservation Officer (SHPO) if the Proposed Action were determined to represent potential adverse effects to cultural resources.

Approximately 91 percent of the Base has been systematically surveyed for cultural resources during the course of more than 20 archaeological investigations and 2 historic architectural investigations conducted at the installation (BAFB 1998). Portions of the installation that remain unsurveyed are limited to heavily disturbed areas associated with the flightline, cantonment, and military family housing areas in the interior of the Base. These areas have been defined by Beale AFB as "archaeologically free zones" based on ethnographic, topographic, and geologic characteristics indicating that these areas have a low potential for intact archaeological deposits (BAFB 1998).

For the purpose of determining potential impacts to cultural resources, the Area of Potential Effects (APE) for the Proposed Action is defined as being confined to the identified work areas within the boundary of the proposed project. The APE for the

Proposed Action has been previously surveyed for cultural resources, and all cultural resources with a visible surface component were located and identified (BAFB 1998). However, deeply buried or masked (heavily vegetated) archaeological resources that were not identified or recorded during the course of previously conducted surveys might exist within the APE. Portions of the Proposed Action would be within geoarchaeologically sensitive areas, as defined by the presence of Perkins and/or Conejo loams typically associated with deeply buried archaeological deposits in the region (BAFB 1998). However, an analysis of the results of previous archaeological studies conducted at the Base regarding archaeological site density and distribution patterns indicates that the overall geoarchaeological sensitivity of the APE is relatively low. No TCPs, cemeteries, or isolated human burials have been identified within the boundaries of the Proposed Action.

An archaeological site record search from the ICRMP (BAFB 2008a) was conducted for previously recorded sites within Proposed Action, including a buffer zone of 200 feet outside of the boundary of the site. The results of the site record search indicate that there are no previously recorded cultural resources in the vicinity of the Proposed Action.

### **3.5 Geological Resources**

An area's geological resources typically consist of surface and subsurface materials and their inherent properties. Soil depth, structure, elasticity, strength, shrink-swell potential, and erodibility determine a soil's ability to support man-made structures and facilities. Soils typically are described in terms of their series or association, slope, physical characteristics, and relative compatibility or constraints with respect to particular construction activities and types of land use.

The Base is between the Great Valley and Sierra Nevada Geologic Provinces and contains characteristics of both (BAFB 1999). A majority of Beale AFB has the geologic characteristics of river floodplains and channels of the Modesto Formation, low alluvial plains and fans of the riverbank formation, and dissected uplands of the Mehrten and Laguna Formations. The remainder of the Base consists of metavolcanic rock characteristic of the Sierra Nevada foothills.

There are ten soil series found on Beale AFB. These were grouped by the Natural Resources Conservation Service (NRCS) according to their topographic position and drainage characteristics. These soil types are Auburn loam, Argonaut-Auburn loams, Auburn-Sobrante loams, Auburn-Sobrante-rock outcrop complex, Conejo loam, Pardee gravelly loam, Pardee-Rancho Seco complex, Perkins loam, Redding-Corning complex, and San Joaquin loam (NRCS 2007). Soil series associated with the Proposed Action is Perkins loam and Redding-Corning complex.

### **3.6 Restoration, Hazardous Materials and Waste**

Hazardous substances are defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that can cause an increase in mortality, a serious irreversible illness, or an incapacitating reversible illness; or pose a substantial threat to human health or the environment. Hazardous waste is defined by the Resource

Conservation and Recovery Act (RCRA) as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that poses a substantial present or potential hazard to human health or the environment. The Department of Defense has also developed the ERP to facilitate thorough investigation and cleanup of contaminated sites on military installations. The ERP is designed to identify, confirm, and clean up problems arising from past releases of hazardous substances and petroleum products into the environment.

### **3.6.1 Hazardous Materials and Waste**

The 9 CES/CEV is responsible for the hazardous material and waste plans for Beale AFB. In conformance with the policies established by Air Force Policy Directive 32-70, 9 CES/CEV has developed plans to manage hazardous materials, hazardous wastes, and special hazards on the Base. Base and contractor personnel collect hazardous wastes at initial accumulation points. From the initial accumulation points, wastes are taken to the Centralized Accumulation Site on the Base and shipped to off-Base disposal facilities. In accordance with the Beale AFB Hazardous Waste Management Program, hazardous wastes are stored on Base for a maximum of 75 days.

### **3.6.2 Asbestos-Containing Material and Lead-Based Paint**

A survey of buildings at Beale AFB was performed to locate, identify, and evaluate any materials containing asbestos. Materials that might contain asbestos include thermal-system insulation and floor tiles. Asbestos-containing material (ACM) is removed on an as-needed basis to minimize health risks from release of asbestos fibers during normal activities, maintenance, renovation, or demolition.

Beale AFB has conducted a survey of buildings for the presence of lead based paint (LBP). The survey mainly focused on child-occupied facilities. The results of the survey are maintained in an LBP database at Civil Engineering.

### **3.6.3 Environmental Restoration Program**

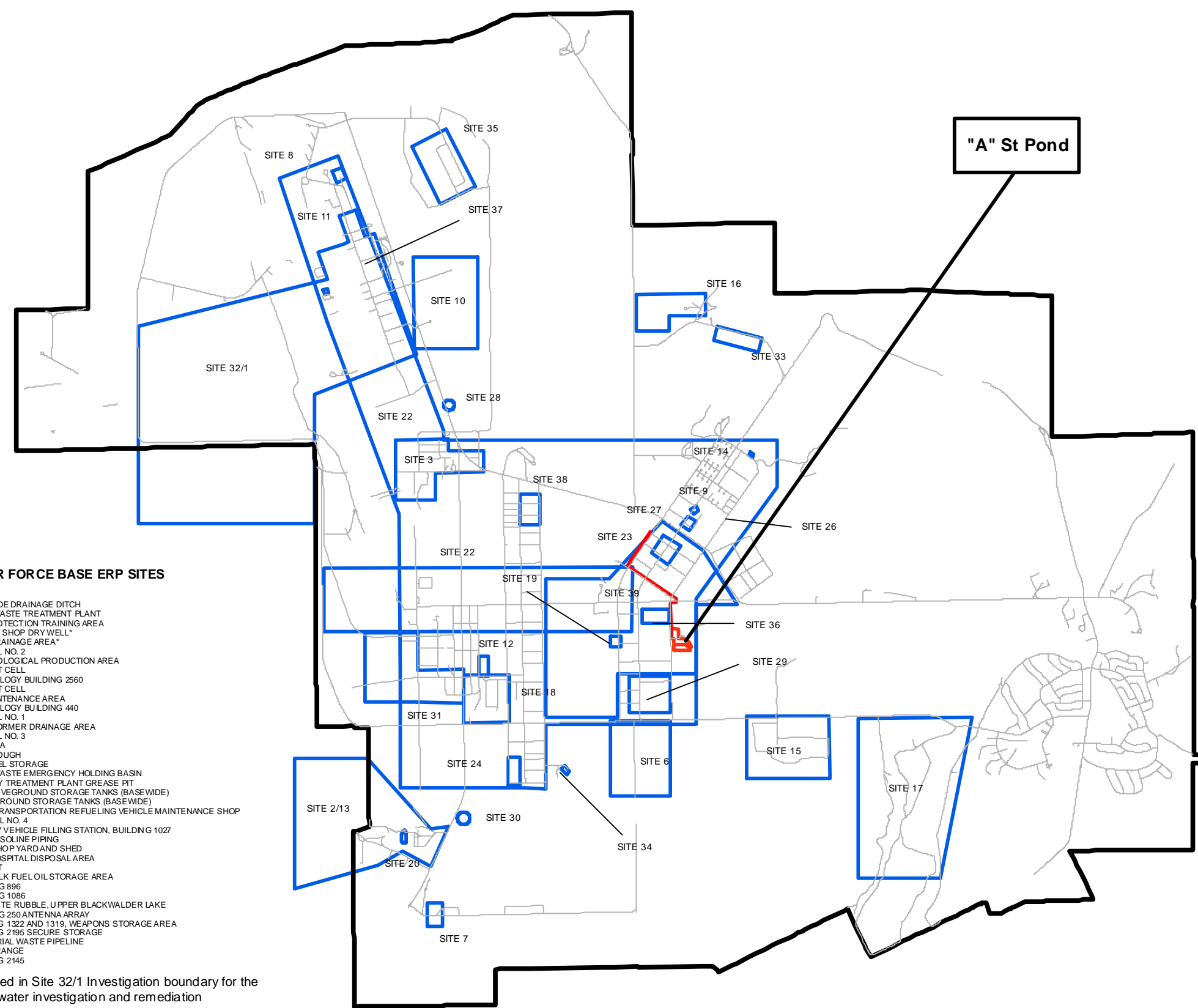
The ERP at Beale AFB began in 1984 with a basewide records search that identified 16 ERP sites for further investigation. Supplemental investigations beginning in the late-1980s and continuing to date brought the total number of Areas of Concern (AOC) to 73 and ERP sites to 40 (Figure 3-3). Primary contaminants in soil and water include fuels, oils, pesticides, herbicides, waste solvents, and inorganic compounds. Progress under the ERP is closely coordinated with various regulatory agencies, including the Cal-EPA Department of Toxic Substance Control and the CRWQCB (BAFB 2006a).

The Proposed Action would overlap two ERP sites. ERP site information relevant to the Proposed Action is described below.

# BEALE AIR FORCE BASE ERP SITES

- SITE 1 (SD-01) WEST SIDE DRAINAGE DITCH
- SITE 2 (WP-02) PHOTOWASTE TREATMENT PLANT
- SITE 3 (FT-03) FIRE PROTECTION TRAINING AREA
- SITE 4 (WP-04) BATTERY SHOP DRY WELL\*
- SITE 5 (SD-05) SR-71 DRAINAGE AREA\*
- SITE 6 (LF-06) LANDFILL NO. 2
- SITE 7 (SD-07) ARMY BIOLOGICAL PRODUCTION AREA
- SITE 8 (SD-08) J-57 TEST CELL
- SITE 9 (SD-09) ENTOMOLOGY BUILDING 2560
- SITE 10 (SD-10) J-58 TEST CELL
- SITE 11 (SD-11) ACE MAINTENANCE AREA
- SITE 12 (SD-12) ENTOMOLOGY BUILDING 440
- SITE 13 (LF-13) LANDFILL NO. 1
- SITE 14 (SD-14) TRANSFORMER DRAINAGE AREA
- SITE 15 (LF-15) LANDFILL NO. 3
- SITE 16 (WP-16) ECO AREA
- SITE 17 (OT-17) BEST SLOUGH
- SITE 18 (ST-18) BULK FUEL STORAGE
- SITE 19 (DP-19) PHOTOWASTE EMERGENCY HOLDING BASIN
- SITE 20 (WP-20) SANITARY TREATMENT PLANT GREASE PIT
- SITE 21 (ST-21) JP-7 ABOVEGROUND STORAGE TANKS (BASEWIDE)
- SITE 22 (ST-22) UNDERGROUND STORAGE TANKS (BASEWIDE)
- SITE 23 (SD-23) NINTH TRANSPORTATION REFUELING VEHICLE MAINTENANCE SHOP
- SITE 24 (LF-24) LANDFILL NO. 4
- SITE 25 (ST-25) MILITARY VEHICLE FILLING STATION, BUILDING 1027
- SITE 26 (CF-26) WWII GASOLINE PIPING
- SITE 27 (SS-27) PAINT SHOP YARD AND SHED
- SITE 28 (LF-28) WWII HOSPITAL DISPOSAL AREA
- SITE 29 (FT-29) BURN PIT
- SITE 30 (AS-30) WWII BULK FUEL OIL STORAGE AREA
- SITE 31 (SD-31) BUILDING 896
- SITE 32 (SD-32) BUILDING 1086
- SITE 33 (SS-33) CONCRETE RUBBLE, UPPER BLACKWALDER LAKE
- SITE 34 (DP-34) BUILDING 250 ANTENNA ARRAY
- SITE 35 (SS-35) BUILDING 1322 AND 1319, WEAPONS STORAGE AREA
- SITE 36 (SS-36) BUILDING 2195 SECURE STORAGE
- SITE 37 (SS-37) INDUSTRIAL WASTE PIPELINE
- SITE 38 (DP-38) SKEET RANGE
- SITE 39 (SS-39) BUILDING 2145

\* Site will be included in Site 32/1 Investigation boundary for the purpose of groundwater investigation and remediation



**Legend**

Installation Boundary

ERP Sites

Road

Railroad

"A" Street Pond Project

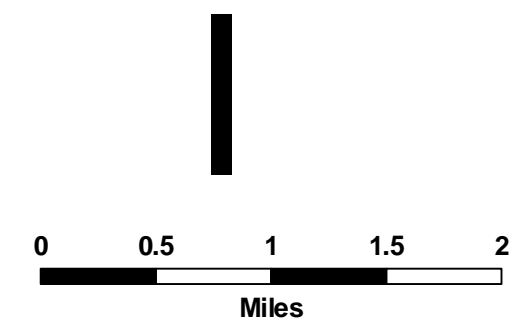


Figure 3-3  
ERP Sites  
Beale Air Force Base  
"A" Street Pond  
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- **ERP Site 22.** The A Street Pond is within ERP Site ST-22. This site consists of underground storage tanks (UST) currently or formerly located at Beale AFB and is part of the Base's RCRA Part B permit. Contaminated soil was identified and removed from the site. Soil vapor extraction and bioventing systems were installed within this site for treatment of residual petroleum hydrocarbons in the soil. Currently, 59 USTs remain open and are scheduled for closure (Burleson 2007).
- **ERP Sites 39.** The A Street Pond is within ERP Site 39. Sites 39 is ranked as a Medium Risk site. The depth to groundwater ranged from about 26 to 49 feet bgs and flowed towards the west in August 2006. Three VOC sources were identified west of the A Street Pond; therefore, contamination would not be expected to be present at the A Street Pond area. Groundwater at ERP Site 39 will be treated as part of the Cantonment Area that includes ERP Sites 19, 23, 36, 39, and 40. A Remedial Investigation is currently underway (CH2M Hill 2007b).

### 3.7 Noise

Noise is sound that is often considered undesirable because it can interfere with speech, communication, or hearing or is otherwise annoying. It can be intense enough to damage hearing. Noise decreases with distance from the source. The distance at which sound can be heard depends on the intensity of the sound, meteorological conditions, terrain, and background noise levels. Potential noise impacts of the Proposed Action would be from construction activities.

Sound levels are stated in decibels (dB), a measure of sound pressure compared to a reference sound pressure. Sound levels calculated as decibel, A-weighted sound levels (dBA), approximate the frequency response of the human ear. Table 3-3 shows the approximate sound levels for typical noise sources.

**Table 3-3. Sound Levels for Some Typical Outdoor Noise Sources**

Noise Level (decibels)	Outdoor Noise
110	Jet flyover at 1,000 feet
100	Gas lawn mower at 3 feet
90	Diesel truck at 50 feet
80	Urban daytime noise
70	Gas lawn mower at 100 feet
60	Heavy traffic at 300 feet
50	Quiet urban daytime
40	Quiet urban night time
30	Quiet rural night time
20	Rustling leaves
10	Mosquito at 3 feet

The Occupational Safety and Health Administration (OSHA) and the California Noise Control Act (California Health and Safety Code Sections 46000 to 46080) apply to the generation of, and exposure to, noise. Counties and local governments set noise regulations to protect communities against nuisance noises and noise from incompatible land uses.

The Noise Element of the Yuba County General Plan has identified the recommended ambient allowable noise level for agricultural land and low density residential uses to be 50 db at any time of day.

### **3.8 Safety and Military Munitions Response Program**

A safe environment is one in which the potential for death, serious bodily injury or illness, or property damage is eliminated or reduced as much as possible. Human health and safety addresses workers' health and safety during burning, demolition and construction activities, and public safety during burning, demolition and construction activities and subsequent operations of those facilities.

All contractors performing construction activities at Beale AFB are responsible for following ground safety regulations and worker compensation programs and are required to conduct construction activities in a manner that does not pose any risk to workers or Base personnel. An industrial hygiene program addresses exposure to hazardous materials, use of personal protective equipment, and availability of Material Safety Data Sheets. Industrial hygiene is a responsibility of contractors.

Beale AFB has several activities that require Explosive Quantity Distance (EQD) Safety Zones. These zones are established to minimize risk and exposure to individuals from explosives and explosive storage facilities. The General Plan shows numerous EQD Safety Zones on the northern and southern parts of the Base (BAFB 2000).

#### **3.8.1 Military Munitions Response Program**

The Military Munitions Response Program (MMRP) was established in 2001 to manage environmental health and safety issues presented by unexploded ordnance (UXO), discarded military munitions, and munitions constituents (MC). The MMRP is an element of the Defense Environmental Restoration Program, under which the Secretary of Defense carries out environmental restoration resulting from historical activities.

The land encompassing Beale AFB was originally part of Camp Beale. Camp Beale was established in 1942 and consisted of approximately 62,000 acres in Yuba and Nevada Counties. Between 1942 and 1964, large portions of Camp Beale were leased, transferred, or sold to other parties. Between 1942 and 1964 the U.S. Army conducted various munitions tests throughout Camp Beale. Since 1964, the USAF has also conducted munitions tests on Beale AFB. In 2001, the USACE conducted an archives search report to determine the historic land uses, range locations, and types of munitions that might have been used on Camp Beale.

In September 2007, a Final Report for the Comprehensive Site Evaluation (CSE) Phase I was completed. The goal of the CSE Phase I was to obtain sufficient data to serve as the

basis for USAF decision making regarding further munitions response actions or investigations. Based on the results presented in the CSE Phase I Report, a Final Work Plan for the CSE Phase II was completed in May 2008. The CSE Phase II Work Plan identifies eight groups of Munitions Response Areas (MRA) to be evaluated.

Any non-intrusive project 'on or near' a potential UXO range/site shall be coordinated through Base Environmental Office and must be approved by SE before any project starts. For all intrusive projects 'on or near' a potential UXO range/site an ESS Report shall be prepared and coordinated through Base Environmental Office to Base Wing Safety to HQ ACC/Safety to AF/Safety Center/Weapons Safety Division to DoD/Explosive Safety Board which has the final approval.

### **3.9 Transportation Resources**

Regional access to Beale AFB is provided by State Route (SR) 65, SR 70, and SR 20. SR 65 is a north-south roadway extending from Interstate 80 in Roseville to SR 70 approximately 7 miles south of Marysville. Five main roads provide access to the Base. North Beale Road extends from SR 70 in Linda to the Main Gate and is the primary road connecting the installation and SR 70, Marysville, and Yuba City. Hammonton-Smartville Road is a two-lane rural roadway providing access from North Beale Road in Linda to SR 20 near Smartville. This roadway provides access to the Base at the Doolittle Gate. Smartville Road is a two-lane rural roadway providing access from the Grass Valley Gate to Hammonton-Smartville Road south of SR 20. South Beale Road is a two-lane roadway providing access from SR 65 northwest of Wheatland to the Wheatland Gate. Spenceville Road is a two-lane rural roadway connecting SR 65 at the City of Wheatland to the Vassar Lake Gate. The road network on Beale AFB consists of arterials, collectors, and local streets. Arterials, those streets that carry the majority of the traffic, include:

- Gavin Mandery Drive (Main Gate to Camp Beale Highway)
- Doolittle Drive (Doolittle Gate to Warren Shingle Road)
- Grass Valley Road/Warren Shingle Road (Grass Valley Gate to "J" Street)
- Camp Beale Highway (Vassar Lake Gate to Warren Shingle Road)
- "J" Street (Wheatland Gate to Doolittle Drive)



## 4.0 Environmental Consequences

This section of the EA analyzes direct and indirect effects on the environment associated with the scope of the Proposed Action as described in Section 2.0 and in consideration of the potentially affected environment as characterized in Section 3.0. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

### 4.1 Air Quality

The potential impacts on local and regional air quality conditions near a proposed Federal action are determined based on the increases in regulated pollutant emissions relative to existing conditions and ambient air quality. Specifically, the impact in NAAQS attainment areas would be considered significant if the net increases in pollutant emissions from the Federal action resulted in one of the following scenarios:

- Cause or contribute to a violation of any national or state ambient air quality standard;
- Expose sensitive receptors to substantially increased pollutant concentrations; or
- Represent an increase of 10 percent or more in an affected AQCR emissions inventory.

Impacts on air quality in NAAQS nonattainment areas are considered significant if the net changes in project-related pollutant emissions result in one of the following scenarios:

- Cause or contribute to a violation of any Federal or state ambient air quality standard;
- Increase the frequency or severity of a violation of any ambient air quality standard;
- Exceed any significance criteria established in a SIP; or
- Delay the attainment of any standard or other milestone contained in the SIP.

Table 3-2 lists Yuba County's Federal and state attainment designation. With respect to the General Conformity Rule, impacts on air quality would be considered significant if the Proposed Action would result in an increase of a Federal nonattainment area's emissions inventory by 10 percent or more for one or more nonattainment pollutants, or if such emissions exceeded *de minimis* threshold levels established in 40 CFR 93.153(b) for individual nonattainment pollutants or for pollutants for which the area has been designated as a nonattainment. Because Yuba County is classified as unclassified/attainment for all criteria pollutants identified by the EPA, a general conformity evaluation is not required.

FRAQMD is responsible for setting thresholds for the area to meet the SIP milestones. FRAQMD has established Thresholds of Significance presented in Table 4-1 for reactive organic gases (ROG), nitrogen oxides (NO<sub>x</sub>), and PM<sub>10</sub>. FRAQMD requires the project

proponent to perform district-approved analysis to determine the air emissions associated with the proposed project, to determine if a threshold will be exceeded, to determine if the project's emissions pose a "significant effect" on air quality, and to submit a Plan detailing conservation measures to be implemented to reduce or eliminate the effects.

**Table 4-1. Project Air Impact Thresholds**

Pollutant		FRAQMD Significance Thresholds (lbs/day)	Conformity <i>de minimus</i> Thresholds (tons/year)
Ozone Precursor Emissions	Reactive Organic Gases (ROG/VOC)	25	N/A <sup>a</sup>
	Oxides of Nitrogen (NO <sub>x</sub> )	25	N/A <sup>a</sup>
Respirable Particulate Matter Emissions	Fine Particulate Matter (PM <sub>10</sub> )	80	N/A <sup>a</sup>

<sup>a</sup>N/A - Not applicable because project area is Federally classified as Attainment or Unclassified

PM<sub>10</sub> - Fine particulate matter less than 10 microns in diameter

Source FRAQMD 2007, USEPA 2005

Because a CARB-designated nonattainment area would be affected by the Proposed Action, the USAF must comply with FRAQMD rules. An analysis was completed to evaluate whether the Proposed Action would be in conformity with applicable FRAQMD requirements. Projected regulated pollutant emissions associated with the Proposed Action were estimated using available construction emissions and other nonpermitted emissions source information. Emissions calculations and threshold comparisons are presented in Appendix A.

#### 4.1.1 Proposed Action

Construction projects would generate PM<sub>10</sub> as fugitive dust from ground-disturbing activities (i.e., grading, demolition, and soil piles) and combustion of fuels in construction equipment. Fugitive dust emissions would be greatest during initial site preparation activities and would vary from day to day depending on the construction phase, level of activity, and prevailing weather conditions. The quantity of uncontrolled fugitive dust emissions from a construction site is proportional to the area of land being worked and the level of construction activity. Fugitive dust emissions can be minimized by wetting down the soil.

Information presented in Section 2 was used to estimate fugitive dust and other criteria pollutant emissions. The construction emissions presented in Table 4-2 include the maximum daily construction emissions associated with the Proposed Action at Beale AFB. These emissions would produce slightly elevated short-term criteria pollutant ambient air concentrations. However, the direct effects would be temporary and would decrease rapidly with distance from the proposed construction sites.

Specific information describing the types of construction equipment required for a specific task, the hours the equipment is operated, and the operating conditions vary widely. For this analysis, parameters were estimated using established methodologies for construction and experience with similar types of construction projects. These emissions would be of a temporary nature.

The emission factors and equipment assumptions for the A Street Pond were generated using guidance in *Guide to Air Quality Assessment* (SMAQMD 2004) and EPA emission factors in AP 42. For the A Street Pond construction, a maximum disturbance of 1 acre per day is assumed, with use of water trucks to reduce fugitive dust emissions. Emission factors, calculations, and estimates of construction-related emissions for the Proposed Action are detailed in Appendix A.

<b>Table 4-2. Maximum Emissions Estimates from the Proposed Action</b>				
<b>Maximum Daily Project Emissions (lbs/day)</b>				
<b>Project</b>	<b>ROG/VOC</b>	<b>NO<sub>x</sub></b>	<b>CO</b>	<b>PM<sub>10</sub></b>
A Street Pond	2.41	14.96	0.45	19.8

FRAQMD is classified by CARB as being in nonattainment for O<sub>3</sub> and PM<sub>10</sub> and is in attainment for all other criteria pollutants. The Base is in the Yuba County portion of FRAQMD that has been classified by USEPA as unclassified/attainment for O<sub>3</sub>. As shown in Table 4-2, the Proposed Action would generate emissions below FRAQMD's thresholds of significance. No significant direct or indirect effects on regional or local air quality would result from implementation of the Proposed Action. Since the base is located in an unclassified/attainment area for criteria pollutants identified by the EPA, no formal conformity analysis is required.

### **Environmental Protection Measures**

No environmental protection measures are required.

#### **4.1.2 No Action Alternative**

Under the No Action Alternative, there would be no change in or effects to air quality at Beale AFB.

## **4.2 Biological Resources**

Determining the significance of potential impacts on biological resources is based on the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource, the percentage of the resource that would be affected relative to its occurrence in the region, the sensitivity of the resource to proposed activities, and the duration of ecological ramifications. Impacts on biological resources are significant if species or habitats of high concern are adversely affected over relatively large areas, or if disturbances cause reductions in population size or impact the distribution of a species of high concern.

### **4.2.1 Proposed Action**

During the design phase of the Proposed Action, extensive efforts were made by Beale AFB to avoid and minimize potential construction-related disturbances (direct or indirect)

on sensitive habitats and associated special-status plant and wildlife species. Plant and wildlife surveys were conducted at the project site to determine the optimal placement of project features in relation to natural features to avoid undue impacts on biological resources. Because of property boundary and mission-related constraints, Beale AFB had little latitude regarding location of the proposed project site, but features would be sited to minimize impacts on sensitive natural resources such as vernal pools, other seasonal wetlands, and associated threatened or endangered species. Additional avoidance measures would be used to minimize impacts to vernal pools or seasonal wetland areas.

### Annual Grasslands

Implementation of the Proposed Action would result in a small loss of nonnative grassland habitat during construction. However, Beale AFB has an abundance of comparable grassland habitat in the surrounding area. Therefore, no adverse impacts on grassland habitat would occur from implementation of the Proposed Action.

### Wetland Resources and Special-Status Species

Vernal pools or seasonal wetlands that are within the project footprint and would be filled, trenched, or removed are considered to be directly impacted. Vernal pools or seasonal wetlands that are within the project footprint and would not be filled, trenched, or removed or those that are outside the project footprint but within 250 feet are generally considered to be indirectly impacted.

Approximately 0.223 acres (0.162 direct and 0.061 indirect) of vernal pools or seasonal wetlands may be impacted by the Proposed Action. In order to minimize or compensate for potential impacts associated with the Proposed Action, 0.446 acres of vernal pools or seasonal wetlands would be preserved and 0.162 acres would be restored (see Table 4-3). These numbers are based upon the mitigation ratios set forth in Beale AFB's Habitat Conservation and Management Plan (HCMP) and agreed upon by the USFWS. Beale AFB's HCMP is referenced in the Beale AFB Integrated Natural Resources Management Plan (INRMP) (BAFB 2005). According to the HCMP, habitat should be preserved at a 2:1 ratio and restored at a 1:1 ratio for direct impacts. For indirect impacts, habitat should be preserved at a 2:1 ratio.

**Table 4-3: Summary of Direct and Indirect Impacts on Shrimp Habitat and Compensation Requirements**

Project		Impacted Acreage		Preservation Acreage	Restoration Acreage	Total Compensation Requirements
		Direct	Indirect			
A Street Pond	Phase I	0.105	0.061	0.332	0.105	0.608
	Phase 2	0.057	0.000	0.114	0.057	
TOTAL ACRES		0.162	0.061	0.446	0.162	

Wet and dry season shrimp sampling at various planned construction locations were conducted during 2006 and 2007. The purpose of the sampling was to determine

presence or absence of listed shrimp species to better help plan impact compensation requirements.

Dry-season quantitative special-status shrimp surveys were conducted in 111 seasonal wetland and wetland complexes on September 5 and 7, 2006 (BAFB 2006b). The federally listed vernal pool fairy shrimp was found to occur in five of the vernal pools sampled. One of the five pools is directly adjacent to the WWTP, the other four pools are located on the northeast corner of “C” Street and 13<sup>th</sup> Street, and are not near the Proposed Action (BAFB 2006b).

Seasonal wetlands are present surrounding the Proposed Action (Figures 4-1 and 4-2). Determinate-level wet-season surveys for listed vernal pool shrimp were conducted at 5 wetlands near the A Street Pond throughout the 2006/2007 rainy season. The 2006/2007 wet season surveys did not identify listed shrimp within the 5 wetlands. Two of the features near the pond were not sampled during the dry-season due to the presence of perennial wetland vegetation and damp soil, which suggested that vernal pool species could not be supported (BAFB 2006b). Results received in July 2008 for the 2008 dry season sampling revealed the presence of vernal pool crustacean cysts in a drainage 350 ft upstream from the project area (BAFB 2008b).

The federally protected Central Valley steelhead (*Oncorhynchus mykiss*) and Chinook salmon (*Oncorhynchus tshawytscha*) habitat occurs in Dry Creek, upstream from the Base, but does not occur within or near the Proposed Action.

The state protected bald eagle is only considered to use the Base for occasional foraging. No disturbance to nesting sites would occur and there is abundant foraging ground in the surrounding areas. Therefore, no adverse affects are expected.

Other species that may be supported by pond or riparian habitat include California red-legged frog (*Rana aurora draytoni*). However, the A Street Pond is considered poor habitat for California red-legged frog. The nearest marginal habitat for the threatened California red-legged frog, which is not known to exist on Base, is the Small Arms Range Pond located 0.8 mile northeast.

Beale AFB initiated formal consultation with the USFWS on February 28, 2009 with the A Street Pond Expansion Biological Assessment. Based on negative results from 2006 dry season and 2007 wet season sampling for vernal pool crustaceans and the poor quality habitat in the project area, Beale AFB argued that the project is not likely to adversely affect vernal pool crustacean habitat. Results received in July 2008 for the 2008 dry season sampling revealed the presence of vernal pool crustacean cysts in a drainage 350 ft upstream from the project area (BAFB 2008b). The presence of the cysts triggered a likely to adversely affect determination from the USFWS; however, the USFWS also determined that the project is not likely to jeopardize the continued existence of the two vernal pool crustacean species or destroy/adversely modify critical habitat for either species because no critical habitat for these species has been designated or proposed within the action area of the proposed project.

Impacts to vernal pool crustaceans would not be significant because compensation for impacts to their habitat would occur per the Beale AFB HCMP and the environmental

protection measures listed below and in the BO from the USFWS would be followed. Additionally, the hydrology of the drainage in which the vernal pool crustacean cysts were found would not change because the drainage will be re-routed around the project area.

***Environmental Protection Measures to be followed (see below):*** Measures 1-7.

### **Environmental Protection Measures**

The environmental protection measures described below were developed through 9 CES/CEV in close collaboration with the USFWS for the WINDO EA (e2M 2005).

***Measure 1: Monitor Construction Activities.*** A qualified biologist from 9 CES/CEV would monitor all construction activities to ensure compliance with avoidance, minimization, and compensation components of the Proposed Action.

The biological monitor would assist construction personnel in compliance with all conservation measures and guidelines. The monitor would be responsible for directing the placement of all stakes, flags, and barriers protecting sensitive resources. The biological monitor would have the authority to stop construction activities if situations arise that could be detrimental to existing wetlands and would only allow construction to resume after corrective actions have alleviated the potential for detrimental activities.

***Measure 2: Conduct Environmental Awareness Training.*** The biological monitor from 9 CES/CEV would conduct environmental awareness training for construction crews before and during project implementation. The education program would briefly cover threatened and endangered species and their habitats that might be encountered during construction or be within close proximity of the Proposed Action project sites. Awareness training would cover all restrictions and guidelines that must be followed by construction crews to avoid or minimize impacts on threatened and endangered species and their habitat. Environmental awareness training would be conducted prior to construction, when crews are about to enter potentially sensitive areas and when new personnel join the construction crews.

Restrictions and guidelines to be observed by construction crews include the following:

- Construction activities would only be allowed from May 1 to October 1.
- All vehicle operators would observe the posted speed limit on paved roads and a 20-mile per hour speed limit on unpaved roads.
- Off-road travel by vehicles or construction equipment would be prohibited outside of designated work areas.
- No non-military firearms or pets would be allowed in the Proposed Action area.
- Motor vehicles and equipment would be fueled and serviced in designated service areas.

- Any worker who inadvertently kills or injures a special-status species, or finds one injured or trapped, would immediately report the incident to the biological monitor. The biological monitor would inform Environmental Flight (9 CES/CEV) who would verbally notify the USFWS Sacramento Endangered Species Office within 3 days and would provide written notification of the incident within 5 days.

***Measure 3: Stake and Flag Boundaries of Work Areas.*** Prior to construction, existing vernal pools will be marked on construction drawings. In the field, the contractor would provide all materials to stake and flag boundaries of the project work area. The contractor would coordinate with the biological monitor from 9 CES/CEV to stake and flag the boundaries of all work and staging areas in portions that have the potential to support vernal pool tadpole shrimp, fairy shrimp, or their habitat. Staking and flagging would be done before construction commences to ensure that construction vehicles, equipment, and personnel would not enter areas that have the potential to be occupied by vernal pool tadpole shrimp, fairy shrimp, or their habitat. The contractor would remove all stakes and flagging within 60 days of construction completion.

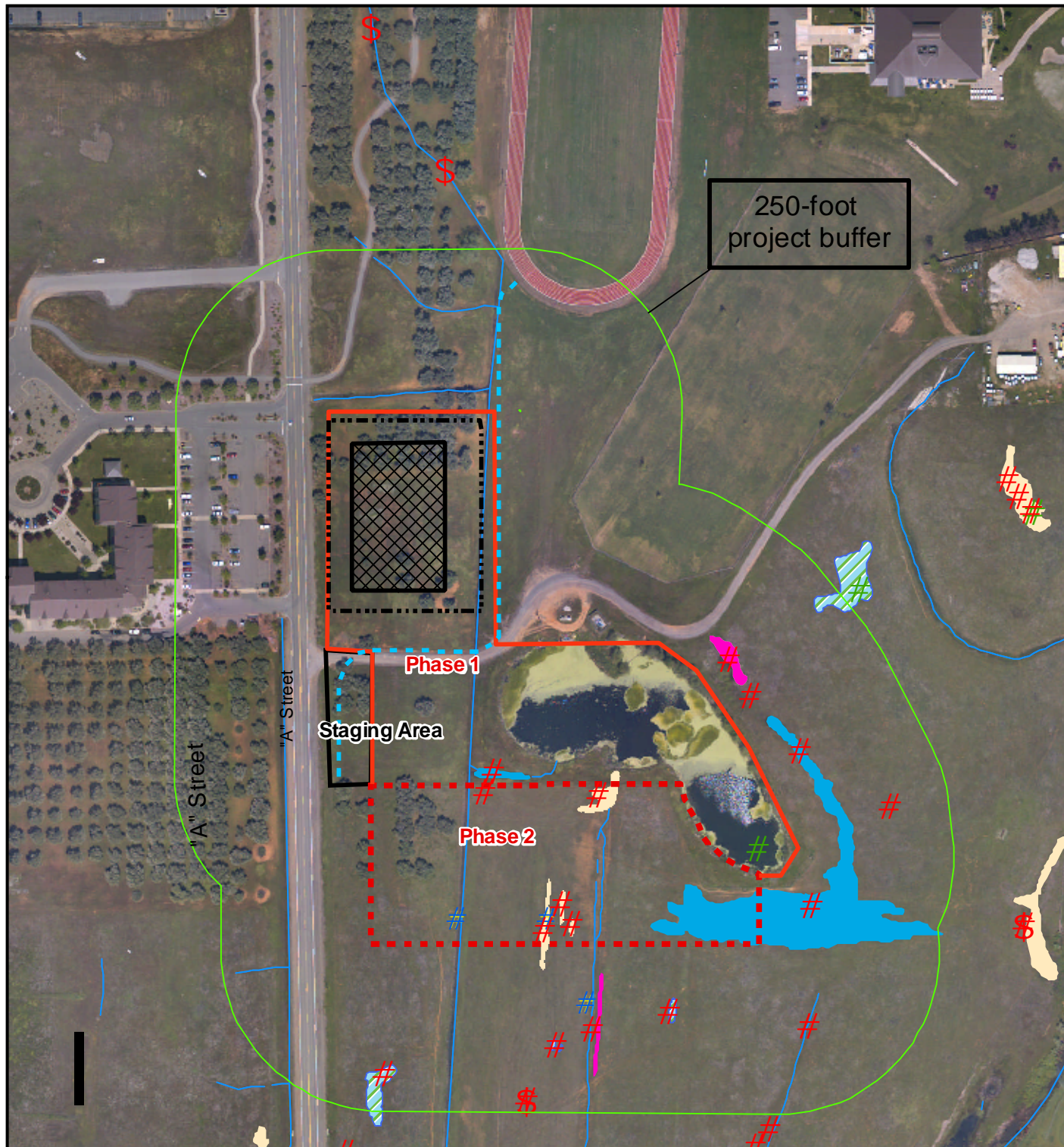
***Measure 4: Stake and Flag Boundaries of Adjacent Vernal Pools and Other Wetlands.*** Potential threatened and endangered species habitat adjacent to the construction area would be protected by the contractor by placing orange barrier material or stakes and flagging around the perimeter of the threatened and endangered species habitat in coordination with the biological monitor from 9 CES/CEV. The contractor would provide all materials to fence, stake, and flag boundaries of the adjacent vernal pools and other wetlands. The location of these barriers would be clearly marked on construction plans and their placement would be supervised by the biological monitor from 9 CES/CEV.

***Measure 5: Designate a Construction Staging Area.*** All construction staging activities would occur within a designated staging area, to be identified by the biological monitor. This site would be located no closer than 250 ft from any existing vernal pool, vernal swale, or other jurisdictional wetlands, and would be marked in the field and on the construction plans. Any spill of hazardous materials would be cleaned up immediately, in accordance with all Federal, state, and local regulations.

***Measure 6: Disposal and Stockpile of Excavated Soil.*** All soil excavated during construction of projects occurring near vernal pool wetlands would be removed and disposed of outside the project area by the contractor. Coordination with 9 CES/CEV and appropriate regulatory requirements is required prior to disposing of this excavated soil.

Soil stockpile locations would be placed more than 250 ft from existing wetlands that are not designated for encroachment. Careful application of water to the stockpile's soils will reduce the potential for air quality contamination by fugitive dust. Watering of other exposed soils related to construction activities would be necessary for dust control and soil compaction. Water application would be directed away from existing vernal pools to avoid triggering vernal pool species growth outside of the normal growing season.





### Legend

- \$ Special-Status Shrimp Species Present 2008
- # Special-Status Shrimp Species Not Present 2008
- \$ Special-Status Shrimp Present 1996
- # Special-Status Shrimp Not Present 1996
- \$ Special-Status Shrimp Present 2006 (Dry)
- # Special-Status Shrimp Not Present 2006 (Dry)
- \$ Special-Status Shrimp Present 2007 (Wet)
- # Special-Status Shrimp Not Present 2007 (Wet)

--- Rerouted Drainage Ditch

--- Berm

--- Drainages

--- "A" St. Pond Phase 2

--- "A" St. Pond Phase 1

Bottom of Excavation

Staging Area

Indirectly Impacted Vernal Pools

Features Not Impacted

Directly Impacted Vernal Pools

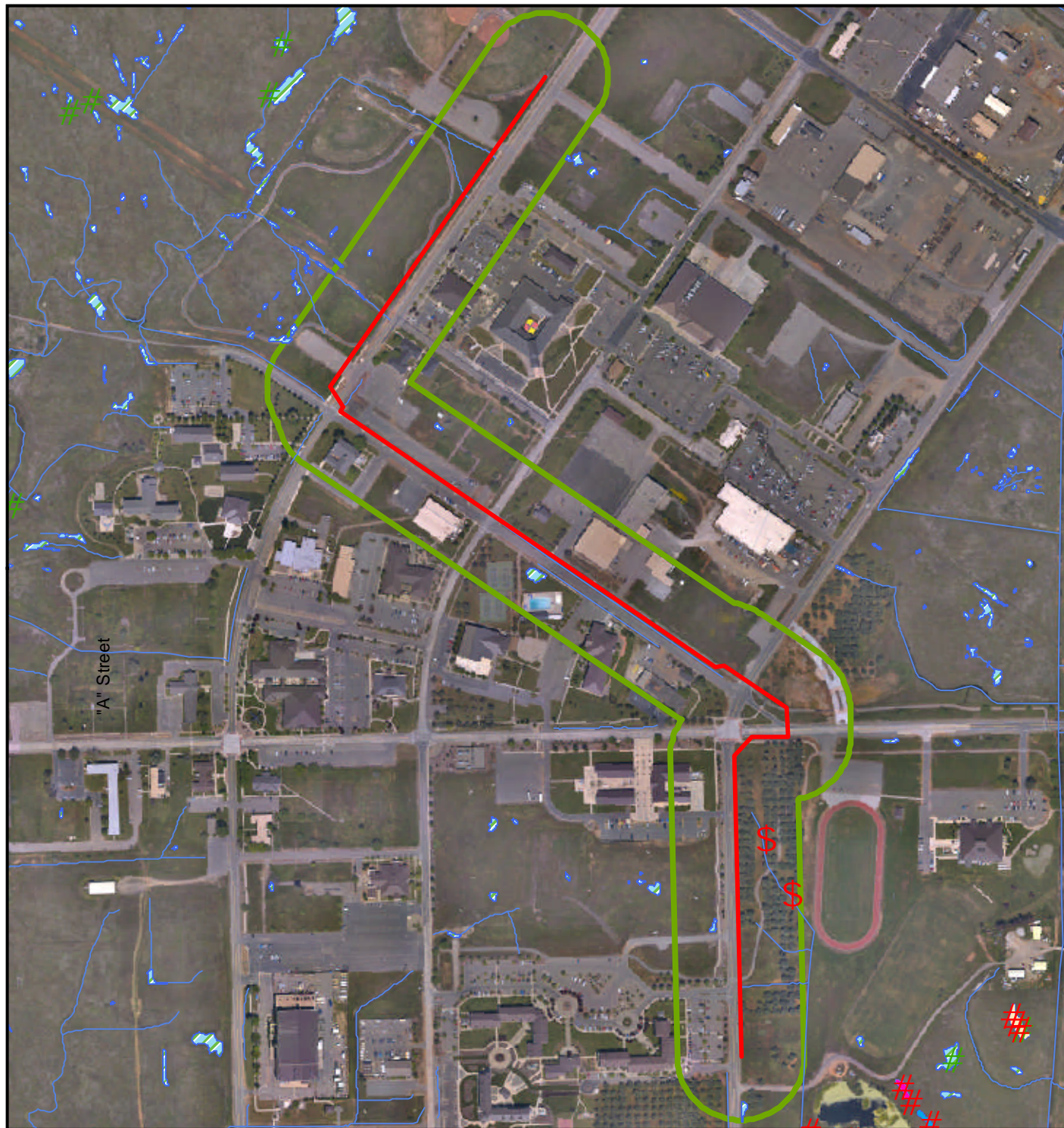
Wetlands Impacted (Not Shrimp Habitat)

0 140 280 420

Feet

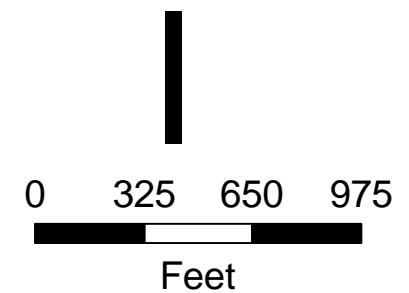
**Figure 4-1**  
**Shrimp Habitat in Vicinity of**  
**"A" Street Pond**  
**Beale Air Force Base**  
**"A" Street Pond**  
**Expansion Project EA**  
**Sep 2008**





### Legend

- Irrigation Pipeline
- 250 Foot Project Buffer
- Drainages
- Indirectly Impacted Vernal Pools
- ▨ Features Not Impacted
- Wetlands Directly Impacted
- \$ Special-Status Shrimp Species Present 2008
- # Special-Status Shrimp Not Present 2008
- # Special-Status Shrimp Present 1996
- \$ Special-Status Shrimp Not Present 1996
- \$ Special-Status Shrimp Present 2006 (Dry)
- # Special-Status Shrimp Not Present 2006 (Dry)
- \$ Special-Status Shrimp Present 2007 (Wet)
- # Special-Status Shrimp Not Present 2007 (Wet)



**Figure 4-2**  
**Shrimp Habitat in Vicinity of**  
**"A" Street Pond**  
**Irrigation Pipeline**  
**Beale Air Force Base**  
**"A" Street Pond**  
**Expansion Project EA**  
**September 2008**

***Measure 7: Compensation for Direct and Indirect Impacts on Vernal Pool Wetlands.***

The project proponent should avoid, minimize, or compensate for project-related impacts on vernal pool wetlands. According to the Beale AFB Habitat Management Plan, projects must compensate for adverse effects on the habitat of listed vernal pool invertebrates by preserving unaffected habitat and restoring new habitat that is eliminated as a result of the Proposed Action (BAFB 2002).

- For every acre of habitat directly affected by the Proposed Action, 2 acres of vernal pool wetlands (branchiopod habitat) would be preserved and 1 acre would be restored on Beale AFB or at another ecosystem preservation bank approved by the USFWS.
- For every acre of vernal pool wetlands indirectly affected by the Proposed Action, 2 acres of similar branchiopod habitat would be preserved on Beale AFB or at another ecosystem preservation bank approved by the USFWS.

**4.2.2 No Action Alternative**

Under the No Action Alternative, there would be no impacts on biological resources at Beale AFB.

**4.3 Water Resources**

Evaluation criteria for water resources impacts are based on water availability, quality, and use; existence of floodplains; and associated regulations. An impact on water resources would be significant if it were to reduce water availability to existing users or interfere with the supply, create or contribute to overdraft of groundwater basins, exceed safe annual yield of water supply sources, adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions, threaten or damage unique hydrologic characteristics, or violate established laws or regulations that have been adopted to protect or manage water resources of an area. The impact of flood hazards on a proposed action is significant if such an action is proposed in an area with a high probability of flooding.

**4.3.1 Proposed Action**

**Surface Waters**

Implementation of the Proposed Action would not be expected to have direct or indirect adverse effects on water quality. Land application of effluent (either treated wastewater or ERP Site 13 effluent) would occur in the same manner as it is currently occurring at the golf course. At the golf course, effluent is only land applied at night. The effluent would meet Waste Discharge Requirements prescribed by the Beale AFB Land Based Discharge National Pollutant Discharge Elimination System (NPDES) permit from the CRWQCB. If the Beale AFB WWTP is upgraded to perform tertiary treatment in the future, restrictions on watering practices may be relaxed.

The Proposed Action would minimally increase the impervious surface area and runoff on the installation. At the proposed project area, storm water runoff would flow into drainage systems that are of sufficient capacity. With adherence to best management practices, adverse effects from erosion would be avoided. Therefore, significant impacts

to surface waters would not be expected as a result of the Proposed Action.

### **Jurisdictional Waters of the U.S.**

To calculate impacts to jurisdictional waters of the U.S., only those areas that would be directly impacted by filling, grading, or compacting were assessed. Phase I impacts include impacts to jurisdictional wetlands from excavation impacts and impacts to drainages that are transected by the new conveyance pipeline. Additionally, an existing drainage would have to be rerouted to accommodate the expansion. The excavation would impact 0.040 acres of jurisdictional wetlands and 0.065 acres (624 linear feet) of the existing drainage would be rerouted (Figure 4-3). The conveyance pipeline would transect 0.009 acres of drainages (Figure 4-4). Beale AFB has applied for Clean Water Act permits from the USACE and CRWQCB for Phase I, which would impact a total of 0.114 acres of jurisdictional waters of the U.S.

The Phase II impacts would include impacts to jurisdictional wetlands from excavation and rerouting of the existing drainage. The excavation would impact 1.826 acres of jurisdictional wetlands, 0.039 acres of which are vernal pools. 0.018 acres of the existing drainage would be rerouted (Figure 4-3). Clean Water Act permits would be submitted to the USACE and CRWQCB for Phase II, which would impact a total of 1.844 acres of jurisdictional waters of the U.S. Approval of the Section 401 and 404 permit applications would be obtained prior to commencement of construction activities.

Environmental protection measures (Table 2-3) would be followed to avoid and/or minimize adverse impacts to jurisdictional waters of the U.S. To minimize and compensate for impacts from construction activities, jurisdictional waters of the U.S. would be compensated for at a 1:1 ratio. The total for compensation would exclude the vernal pools that would be compensated for as Threatened and Endangered Species habitat. Additionally, compensation is not required for impacts where there is no net loss, such as where a drainage will be re-routed.

***Environmental Protection Measures to be followed (see below):*** Measures 1-2.

### **Groundwater**

None of the activities associated with the Proposed Action would be expected to affect groundwater quality.

### **Floodplains**

The Proposed Action involves construction projects within portions of the 100- and 500-year floodplain on Beale AFB (see Figure 3-2).

The Proposed Action could impact about 0.4 and 3.9 acres of the 100- and 500-year floodplain, respectively. During construction, impacts would be minimized by using best management practices. In addition, the Proposed Action would be designed to allow adequate storm water drainage and free flow of water during rain events. Therefore, the Proposed Action would not adversely impact floodplains at Beale AFB.

The A Street Pond Expansion would have a positive effect on floodplains on Beale AFB. The project would increase surface water storage and improve water quality by increasing

filtration capabilities.

The Proposed Action could impact about 0.4 and 3.9 acres of the 100- and 500-year floodplain, respectively. During construction, impacts would be minimized by using best management practices. In addition, the Proposed Action would be designed to allow adequate storm water drainage and free flow of water during rain events. Therefore, the Proposed Action would not adversely impact floodplains at Beale AFB.

The A Street Pond Expansion would have a positive effect on floodplains on Beale AFB. The project would increase surface water storage and improve water quality by increasing filtration capabilities.

### **Environmental Protection Measures**

***Measure 1: Best Management Practices.*** The contractor would adhere to best management practices and applicable codes and ordinances to reduce storm water runoff-related impacts to a level of insignificance. The following best management practices would be followed by the contractor prior to and during construction activities:

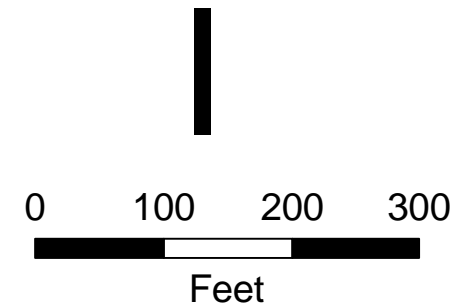
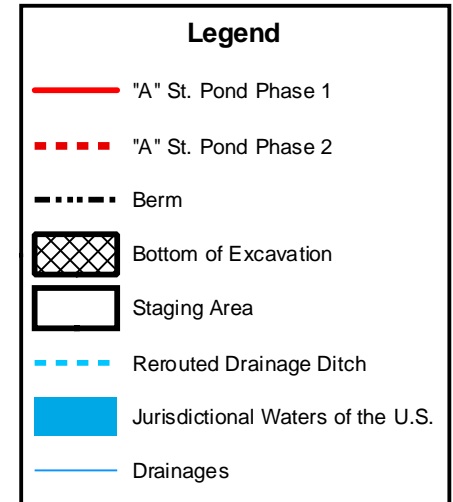
- Construction activities would only be allowed from May 1 to October 1.
- Erosion and sediment controls would be in place during construction to reduce and control siltation or erosion impacts on areas outside of the proposed construction sites.
- All vehicle operators would observe the posted speed limit on paved roads and a 20-mile per hour speed limit on unpaved roads.
- Off-road travel by vehicles or construction equipment would be prohibited outside of designated work areas.
- Motor vehicles and equipment would be fueled and serviced in designated service areas.

***Measure 2: Disposal of Excavated Soil.*** The soil and shoulder base rock that would be excavated during the pipeline construction would be piled adjacent to the trench and will be returned to the trench upon installation of the pipe. The soil excavated during expansion of the pond that would affect jurisdictional waters of the U.S. would be removed and disposed of by the contractor outside the project area. Some of the soil would be used to construct a berm around the pond. Coordination with 9 CES/CEV is required prior to disposing of this excavated soil.

### **4.3.2 No Action Alternative**

Under the No Action Alternative, Beale would continue to have limited capabilities for land application of effluent. During unexpected storm events, Beale may be forced to discharge effluent to surface waters and could face violation of the LBD NPDES permit for not meeting discharge requirements.









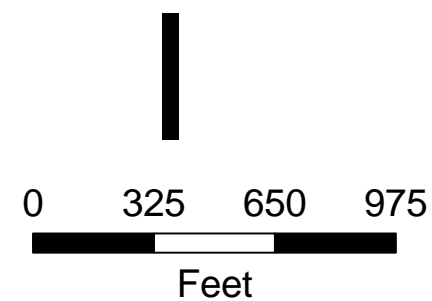
**Figure 4-3**  
**Jurisdictional Waters of the U.S.**  
**Impacted by "A" Street Pond**  
**Beale Air Force Base**  
**"A" Street Pond**  
**Expansion Project EA**  
**Sep 2008**





#### Legend

-  Irrigation Pipeline
-  Jurisdictional Waters Directly Impacted
-  Drainages
-  Jurisdictional Waters of the U.S.



**Figure 4-4**  
**Jurisdictional Waters of the U.S.**  
**Impacted by "A" Street Pond**  
**Irrigation Pipeline**  
**Beale Air Force Base**  
**"A" Street Pond**  
**Expansion Project EA**  
**Sep 2008**



## 4.4 Cultural Resources

The analysis of the potential impacts and adverse effects on cultural resources associated with proposed actions on Federal property includes the assessment of both direct and indirect impacts on cultural resources and the determination of their potential to result in adverse effects on identified historic properties or unevaluated, potentially eligible resources. Adverse effects include physically altering, damaging, or destroying; altering a defining characteristic that is a contributing element to the eligibility of; the introduction of visual or audible elements that are out of character or affect the original setting of; or the intentional or benign neglect of a historic property or potentially eligible resource that results in its full or partial destruction. Adverse effects associated with indirect impacts typically include the cumulative effects of the intensified use of an area in which a historic property or unevaluated resource is located resulting from construction or project-related improvement of the area, including improvements to transportation corridors in the vicinity that provide for or indirectly lead to increased access to the area.

### 4.4.1 Proposed Action

There was no cultural resource sites listed in the Beale ICRMP (BAFB 2008a) within the APE. The Proposed Action would not be expected to impact cultural resources; therefore, there would be no adverse effects. Previously unidentified subsurface archaeological deposits might exist within the boundary of the Proposed Action. Implementation of the Standard Operating Procedures contained in the Beale AFB ICRMP (BAFB 2008a) and the cultural resources environmental protection measures contained in this EA would ensure that the Proposed Action would not result in adverse effects on potentially eligible cultural resources. There would be no indirect or adverse impacts on unknown, potentially eligible cultural resources.

***Environmental Protection Measures to be followed (see below):*** Measures 1-2.

#### **Environmental Protection Measures**

***Measure 1: Cultural Resources Awareness Training.*** All construction and maintenance personnel would receive cultural resources awareness training by 9 CES/CEV regarding the appropriate work practices necessary to effectively protect cultural resources. This training would address Federal, state, and local laws regarding cultural resources; the importance of these resources and the purpose and necessity of protecting them; and the appropriate methods for reporting and protecting inadvertently discovered cultural resources.

**Measure 2: Inadvertent Discovery of Archaeological Resources.** The following procedure applies to the inadvertent discovery of archaeological remains during ground disturbing activities at the installation. This procedure does not apply to cultural resources studies or archaeological research projects contracted or permitted by USAF. *Any unknown site or other cultural remains inadvertently discovered must be assumed to be potentially eligible for the NRHP listing and afforded appropriate protection until it is determined to be otherwise.*

- **Stop work and notify the installation's Cultural Resources Manager.** In the event that human remains, artifacts, or other archaeological materials are discovered during the course of any action, project, or activity at Beale AFB, all ground disturbing activity at the point of discovery, plus a reasonable buffer exclusionary area, **MUST BE HALTED** and the CRM notified.

#### **4.4.2 No Action Alternative**

Under the No Action Alternative, the eight components of the Proposed Action would not be implemented and there would be no changes to cultural resources within the boundary of the installation.

### **4.5 Geological Resources**

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating environmental consequences of a proposed action on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

#### **4.5.1 Proposed Action**

Under the Proposed Action, construction activities, such as grading, excavation, and recontouring of the soil, would result in direct effects on soil. Implementation of best management practices during construction would limit environmental consequences resulting from construction activities. Therefore, direct or indirect effects on soils, regional or local topography, or physiographic features at the Base would not be significant from implementation of the Proposed Action.

### **Environmental Protection Measures**

Fugitive dust from construction activities would be minimized by watering and soil stockpiling, thereby reducing to negligible levels the total amount of soil exposed. Standard erosion control means (silt fencing, sediment traps, application of water sprays, and revegetation at disturbed areas) would also reduce environmental consequences related to those characteristics.

#### **4.5.2 No Action Alternative**

Under the No Action Alternative, there would be no change in or effects on geological resources at Beale AFB.

## **4.6 Restoration, Hazardous Materials and Waste**

Environmental consequences associated with hazardous material and waste would be significant if the storage, use, transportation, or disposal of these substances were to substantially increase the risk to human health or exposure to the environment. Impacts from ACM and LBP would be considered significant if OSHA standards were exceeded. Impacts on the ERP would be considered significant if the Federal action disturbed (or created) contaminated sites resulting in adverse effects on human health or the environment.

### **4.6.1 Proposed Action**

#### **Hazardous Materials and Waste**

Construction activities associated with the Proposed Action would require the use of certain hazardous materials such as paints, welding gases, solvents, preservatives, and sealants. It is anticipated that the quantity of products containing hazardous materials used during the construction of the Proposed Action would be minimal and their use would be of short duration. The quantity of hazardous wastes generated from proposed construction activities would be negligible. Therefore, hazardous materials and wastes at Beale AFB would not be impacted by the proposed construction activities.

#### **Asbestos-Containing Material and Lead-Based Paint**

USAF regulations prohibit the use of ACM and LBP for new construction. Specifications for new facilities would be in accordance with USAF policies and regulations.

#### **Environmental Restoration Program**

Projects included in the Proposed Action are within several active ERP sites including Site 22 and Site 39.

- The A Street Pond is within ERP Site 22. This site is a basewide UST site. There are no USTs within the foot print of the excavation. The closest UST sites are closed.
- The A Street Pond is within ERP Site 39, but hydrogeologically upgradient from the contaminant sources.

Based on the above information, 9 CES/CEVR determined that an ERP waiver is not required for this project.

#### **Environmental Protection Measures**

Although there is a low likelihood for construction workers to be exposed to contamination from ERP sites during construction, it is recommended that a health and safety plan be prepared by the contractor in accordance with OSHA requirements prior to commencement of construction or burning activities on ERP sites. Should contamination be encountered, handling, storage, transportation, and disposal activities would be conducted in accordance with applicable Federal, state, and local regulations; AFIs; and Beale AFB programs and procedures. Workers at the ERP sites listed above should either have OSHA 40-hour Hazardous Waste Operations and Emergency Response

training, or a supervisor should have OSHA Site Supervisor certification. Current site-specific information about contamination, UST sites, and ERP infrastructure on and around each project site should be obtained prior to construction or burning and site-specific health and safety plans should be prepared. Project planning should include protection of ERP infrastructure such as monitoring wells, treatment systems, and conveyance pipes to avoid disruption of clean-up activities. Prior to the project start on any environmental restoration site a waiver must be submitted to HQ ACC/A7A for approval.

#### **4.6.2 No Action Alternative**

Under the No Action Alternative, there would be no change in or effects on hazardous materials and wastes at Beale AFB.

### **4.7 Noise**

Environmental consequences associated with noise would be significant if the Proposed Action resulted in the generation of noise levels in excess of standards established in the local noise ordinance. The Noise Element of the Yuba County General Plan has identified the recommended ambient allowable noise level for agricultural and low density residential land uses to be 50 dB at any time of day.

#### **4.7.1 Proposed Action**

A temporary increase in noise levels would occur during construction. Construction and operation of the Proposed Action is not expected to generate excessive noise. The nearest sensitive noise receptor is over 2.5 miles from the proposed project location. No significant impacts to noise would occur as a result of the proposed action.

#### **Environmental Protection Measures**

No environmental protection measures are required.

#### **4.7.2 No Action Alternative**

Under the No Action Alternative, there would be no change in noise at Beale AFB.

### **4.8 Safety and Military Munitions Response Program**

A significant impact would occur if the Proposed Action were to substantially increase risks associated with the safety of Beale AFB personnel, contractors, or the local community; or substantially hinder the ability to respond to an emergency. Impacts were assessed based on the potential effects of construction activities.

#### **4.8.1 Proposed Action Safety**

Short-term, minor direct adverse effects would be expected from the Proposed Action. Implementation of the Proposed Action would slightly increase the short-term risk associated with construction activities at Beale AFB during the normal workday because the level of such activity would increase. Contractors would be required to establish and maintain safety programs. Projects associated with the Proposed Action would not be expected to pose a safety risk to Base personnel or activities. The proposed construction

projects would enable the Base to meet future mission objectives and conduct or meet mission requirements in a safe operating environment.

### **Military Munitions Response Program**

During construction and burning activities associated with the Proposed Action, construction and fire crew workers would have a possibility of encountering UXO or Chemical Agent Identification Sets. A Phase I Comprehensive Site Evaluation (CSE), completed in September 2007, gives a preliminary assessment of Munitions Response Areas (MRA) on Base. A Phase II CSE is currently underway and will provide more information about the boundaries and characteristics of each MRA on Base. Although none of the proposed project sites are located on any MRA identified in the Phase I CSE, safety measures must still be taken until the MRAs are further delineated. Contractors would be required to comply with the Environmental Protection Measures for MMRP (Table 2-3) thereby reducing impacts to less than significant.

### **Environmental Protection Measures**

All non-intrusive work shall be coordinated with the Base Environmental Office and shall be approved by SE before any project starts. For all intrusive work an ESS Report shall be prepared and coordinated through the Base Environmental Office to Wing Safety to HQ ACC/Safety to AF/Safety Center/Weapons Safety Division to DoD/Explosive Safety Board for final approval.

#### **4.8.2 No Action Alternative**

Under the No Action Alternative, there would be no change in or effects on construction worker safety.

## **4.9 Transportation**

Impacts on transportation are considered to be adverse if the Proposed Action would result in a substantial increase in traffic, which is defined as more than 50 trips per hour, on local roadways. Project trip generation is based on an estimate of the number of equipment and crew members that would be present during construction activities.

### **4.9.1 Proposed Action**

The construction phases of the Proposed Action would require delivery of materials to and removal of debris from the construction site. Construction traffic would comprise a small percentage of the total existing traffic and many of the vehicles would be driven to and kept onsite for the duration of construction, resulting in relatively few additional trips. Furthermore, potential increases in traffic volume associated with proposed construction activities would be temporary. Heavy vehicles are frequently on Base roads. Therefore, the vehicles necessary for construction would be expected to have a minor adverse impact on Base roads. All road and lane closures would be coordinated with the Security Forces and would be temporary in nature; therefore, no adverse direct or indirect effects on transportation systems would be expected.

### **Environmental Protection Measures**

No environmental protection measures are required.

#### **4.9.2 No Action Alternative**

Under the No Action Alternative, there would be no change in or effects on traffic at Beale AFB.

## 5.0 Cumulative and Adverse Impacts

Cumulative impacts on environmental resources result from incremental effects of the Proposed Action, when combined with other past, present, and reasonably foreseeable future projects in the area. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (Federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

Table 5-1 summarizes potential cumulative effects on resources from the Proposed Action, when combined with other past, present, and future activities. No significant impacts on the environment would be anticipated from the Proposed Action in conjunction with these activities.

### 5.1 Unavoidable Adverse Impacts

Unavoidable adverse impacts would result from implementation of the Proposed Action. None of these impacts would be significant.

**Biological Resources.** The Proposed Action would result in minimal loss of vegetation and wildlife habitat. Because implementation of the Proposed Action would result in temporary or very minor effects on other resources on Beale AFB, the Proposed Action would not contribute to a substantial cumulative effect on other biological resources.

**Energy.** The use of nonrenewable resources is an unavoidable occurrence, although not considered significant. The Proposed Action would require the use of fossil fuels, a nonrenewable natural resource. Energy supplies, although relatively small, would be committed to the Proposed Action or No Action Alternative.

**Geological Resources.** Under the Proposed Action, construction activities, such as grading, excavating, and recontouring of the soil, would result in soil disturbance. Implementation of best management practices during construction would limit environmental consequences resulting from construction activities. Standard erosion control means would also reduce environmental consequences related to construction. Although unavoidable, effects on soils at the Base are not considered significant.

**Restoration, Hazardous Materials and Waste.** The generation of hazardous materials and wastes is unavoidable. However, the generation of hazardous materials and wastes would not significantly increase over baseline conditions and, therefore, is not considered significant.

**Table 5-1. Cumulative Effects on Resources**

<b>Resource</b>	<b>Past Actions</b>	<b>Current Background Activities</b>	<b>Proposed Action</b>	<b>Known Future Actions</b>	<b>Cumulative Effects</b>
<b>Air Quality</b>	Moderate transitional nonattainment area for O <sub>3</sub> and PM <sub>10</sub> .	Emissions from aircraft, vehicles, and stationary equipment.	Potential dust generation during soil removal, site grading, and construction.	Potential dust generation during soil removal, site grading, and construction.	Continued moderate transitional nonattainment area for O <sub>3</sub> and PM <sub>10</sub> . Actions would be <i>de minimus</i> . Effect not significant.
<b>Biological Resources</b>	Degraded historic habitat of sensitive and common wildlife species.	Beale AFB operations and development impact wildlife habitat.	Minor disturbance of vegetation by construction. Direct, indirect, and temporary effects on threatened and endangered species.	Minor disturbance of vegetation by construction. Direct, indirect, and temporary effects on threatened and endangered species.	Permanent loss of vegetation and low quality habitat. Direct and indirect effects on threatened and endangered species. Effects not significant.
<b>Cultural Resources</b>	Possible destruction of unknown artifacts.	Identification and recordation of historic and cultural resources.	Project could impact unknown historic archaeological sites.	Project could impact unknown historic archaeological sites.	Projects could impact unknown historic archaeological sites. Effect not significant.
<b>Geographical Resources</b>	Past Beale AFB development has modified soils.	Beale AFB development modifies soils.	Grading, excavation, and recontouring of the soil would result in further disturbance.	Grading, excavating, and recontouring of the soil would result in further soil disturbance.	Impacts would be permanent but localized. Effect not significant.



**Table 5-1. Cumulative Effects on Resources**

<b>Resource</b>	<b>Past Actions</b>	<b>Current Background Activities</b>	<b>Proposed Action</b>	<b>Known Future Actions</b>	<b>Cumulative Effects</b>
<b>Restoration, Hazardous Materials and Waste</b>	Mission operations created hazardous materials and waste. Identification and recordation of ERP sites and AOCs.	Mission operations create hazardous materials and waste. Identification and recordation of ERP sites and AOCs.	Construction activities would generate small amounts of hazardous materials and waste. Construction activities would be located within ERP sites.	Construction activities would generate small amounts of hazardous materials and waste.	Small temporary increase in generation of hazardous materials and waste. Effect not significant.
<b>Noise</b>	Ambient noise on Beale AFB has generally been made up of wind and rustling vegetation, aircraft, and minor traffic.	Ambient noise on Beale AFB is generally made up of wind and rustling vegetation, aircraft, and minor traffic.	Temporary increase in noise during construction activities.	Temporary increase in noise during construction activities.	Periodic increases in noise levels from construction. Effect not significant.
<b>Safety</b>	Portions of the Base have been used as active ranges.	Identification and recordation of historic and active ranges.	Short-term effects on construction workers from construction activities and potential UXO. Not located on identified Munitions Response Areas.	Short-term effects on construction workers from construction activities and potential UXO.	Short-term effects on construction workers from construction activities and potential UXO. Effect not significant.
<b>Transportation</b>	Traffic infrastructure has been constructed on Base.	Traffic infrastructure currently has been constructed and maintained on the Base.	Short-term effects on traffic circulation and road closures from construction activities.	Short-term effects on traffic circulation and road closures from construction activities.	Short-term effects on traffic circulation and road closures from construction activities. Effects not significant.

**Table 5-1. Cumulative Effects on Resources**

Resource	Past Actions	Current Background Activities	Proposed Action	Known Future Actions	Cumulative Effects
<b>Water Resources</b>	Surface water quality moderately impacted by development.	Surface water quality moderately impacted by development.	Potential sedimentation from construction activities and minor increase in percentage of impervious surface area.	Potential sedimentation from construction activities and minor increase in percentage of impervious surface area.	Increased impervious area would have negligible effects on storm water discharges and water quality. Effect not significant.

AOC – Area of Concern

ERP – Environmental Restoration Program

O<sub>3</sub> – Ozone

PM<sub>10</sub> – particulate matter less than or equal to 10

microns in diameter

UXO – unexploded ordnance

## 5.2 Compatibility of the Proposed Action and Alternatives with the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

Impacts on the ground surface as a result of the Proposed Action would occur entirely within the boundaries of Beale AFB. Construction activities would not result in any significant or incompatible land use changes on- or off-Base. The proposed projects have been sited according to future land use zones. Consequently, construction activities would not be in conflict with future Base land use policies or objectives. The Proposed Action would not conflict with any applicable off-Base land use ordinances or designated clear zones.

## 5.3 Irreversible and Irretrievable Commitments of Resources

The irreversible environmental changes that would result from implementation of the Proposed Action involve the consumption of material resources, energy resources, land, biological habitat, and human resources. The use of these resources is considered to be permanent.

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that use of these resources would have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame (i.e., energy and minerals).

**Material Resources.** Material resources used for the Proposed Action include building materials (for construction of facilities), concrete and asphalt (for roads), and various material supplies (for infrastructure). Most of the materials that would be consumed are not in short supply, would not limit other unrelated construction activities, and would not be considered significant.

***Energy Resources.*** Energy resources utilized for the Proposed Action would be irretrievably lost. These include petroleum-based products (such as gasoline and diesel), natural gas, and electricity. During construction, gasoline and diesel would be used for the operation of construction vehicles. During operation, gasoline would be used for the operation of private and government-owned vehicles. Natural gas and electricity would be used by operational activities. Consumption of these energy resources would not place a significant demand on their availability in the region. Therefore, no significant effects would be expected.

***Biological Resources.*** The Proposed Action would result in a minimal loss of vegetation and wildlife habitat on proposed construction sites. However, proposed construction is mostly occurring on already disturbed land.

***Human Resources.*** The use of human resources for construction and operation is considered an irretrievable loss, only in that it would preclude such personnel from engaging in other work activities. However, the use of human resources for the Proposed Action represents employment opportunities and is considered beneficial.

## **6.0 Consultation and Coordination**

The following is a list of Federal and county agencies contacted during preparation of the EA. Individual groups were contacted for background information, consultation, and general input.

### ***Federal***

- U.S. Army Corps of Engineers – Mr. Tom Cavanaugh
- U.S. Fish and Wildlife Service – Mr. Richard Montgomery

### ***State***

- California Regional Water Quality Control Board – Mr. Robert Reeves and Mr. Pat Gillum

## 7.0 List of Preparers

This EA has been prepared under the direction of Beale AFB. The individuals who contributed to the preparation of this document are listed below.

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Years of Experience: 5

## 8.0 References

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## **Appendix A**

### **Emissions Calculations**



## Beale AFB A Street Pond Expansion EA Summary

Maximum Daily Project Emissions (lbs/day)				
Project	ROG/VOC	NO <sub>x</sub>	CO	PM <sub>10</sub>
A Street Pond	2.41	14.96	0.45	19.8

Emissions calculated for 2007

### A St. Pond Emission Factors

Equipment Assumptions

HH Duty Diesel Trucks	2	8 trips/day, 10 miles/trip
Graders	1	
Tractors/Loaders/Backhoes	1	

### On-Highway Vehicles for Year 2007

#### EMFAC 2002 Rates

Emission Rates for 2007 converted to lbs/day per piece of equipment

Equipment	Pollutant			
	ROG/VOC	NO <sub>x</sub>	PM10	CO
HH Duty Diesel Trucks	0.0790	2.1531	0.0593	0.4148

Total Number of Trucks 2

### Other Construction Equipment

From SMAQMD Guide to Air Quality Assessment 2004 Table 3-2

Emission Rates for 2007 in lbs/day per piece of equipment

Equipment	Pollutant			
	ROG/VOC	NO <sub>x</sub>	PM10	CO
Graders	1.76	10.22	0.28	14.98
Tractors/Loaders/Backhoes	0.65	4.74	0.17	4.82

Assume maximum of 1 acre disturbed per day.

Fugitive dust from ground disturbance

10 lbs PM10/acre-day

	ROG/VOC	NO <sub>x</sub>	PM10	CO
Total Emissions lbs/day	2.41	14.96	0.45	19.8

If the project takes approximately 80 days, the total emissions would be as follows:

<b>ROG/VOC</b>	<b>NOx</b>	<b>PM10</b>	<b>CO</b>
<b>19.28</b>	<b>1196.8</b>	<b>36</b>	<b>1584.0</b>

**Appendix B**  
**Biological Assessment Submitted to the**  
**U.S Fish and Wildlife Service**



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846



In reply refer to:  
81420-2008-F-1076-1

AUG 7 2008

Joni L. Gerry, YC-02, DAF  
Deputy Base Civil Engineer  
9 CES/CC  
6451 B Street  
Beale AFB, California 95903-1708

Subject: Request to Initiate Formal Consultation Regarding the Proposed A Street Pond Expansion Project, Beale Air Force Base, Yuba County, California.

Dear Ms. Gerry:

This letter is in response to your February 28, 2008, request to initiate formal consultation, received by the U.S. Fish and Wildlife Service (Service) on March 3, 2008, for the proposed A Street Pond (pond) Expansion Project at Beale Air Force Base, Yuba County, California (proposed project). At question are the impacts of the proposed project on the federally-endangered vernal pool tadpole shrimp (*Lepidurus packardii*) (VPTS), and the threatened vernal pool fairy (*Branchinecta lynchi*) (VPFS) (collectively, vernal pool crustaceans). Our primary concern and mandate is the protection of federally-listed species pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). This biological opinion was prepared in accordance with section 7 of the Act.

This biological opinion (BO) is based on: (1) the February 28, 2008, *A Street Pond Expansion Project Biological Assessment* (BA) that was prepared by Beale Air Force Base (Beale AFB), (2) additional information provided by Beale AFB, (3) a June 11, 2008, site visit, and (4) other information available to the Service. In your letter requesting initiation, you also requested the Service consider a determination of *not likely to adversely affect* for the proposed project. After review of the above information, the Service can not concur with a finding of *not likely to adversely affect* the listed species being considered within this biological opinion.

#### Consultation History

February 13, 2007: Site visit by Karen Leyse (Service), with Beale AFB personnel Kirsten Christopherson and Jamie Visinoni.



*March 3, 2007:* Service received from Beale AFB the request to initiate formal consultation and the BA, dated February 28, 2007.

*June 11, 2008:* Site visit by Richard Montgomery (Service), with Beale AFB personnel K. Christopherson and J. Visinoni

*June 17, 2008:* Service requested and received a revised impacts/compensation table via electronic mail.

*July 17, 2008:* Service received preliminary results of 2008 dry-season survey for proposed project site. The survey detected *Branchinecta* and *Lepidurus* cysts within the area surrounding the proposed project.

*July 21, 2008:* J. Visinoni (Beale AFB) sent by electronic mail a revised section 5.9 of the BA for the project (page 5-6), increasing the amount of impacts by the proposed project. A revised Table 5-1 was included.

## **BIOLOGICAL OPINION**

### **Description of the Proposed Action**

The A Street Pond is a wastewater holding pond located in the central portion of Beale AFB, which has been highly disturbed over the years. Currently, waste Water Treatment Plant (WWTP) effluent is pumped to the 1.8 million gallon A Street Pond. The pond can provide up to 1 million gallons of water per day for irrigation at the nearby golf course and is authorized to do so by the California Regional Water Quality Board (CRWQCB). Waste Discharge Requirements governing Beale's waste water effluent will change on April 1, 2009, and following that date, all WWTP effluent will be land applied. After completion of the expansion, Site 13 Groundwater Treatment System (GTS) effluent water will be pumped in place of the WWTP effluent using existing conveying piping. GTS effluent water can be used at the golf course and all over the main base for irrigation purposes as authorized by CRWQCB. All WWTP effluent will be land applied at an existing 40-acre cannon field just south of the WWTP. There will be two phases of expansion at the A Street Pond (Phase I and Phase II).

#### Phase I

The total acreage of A Street Pond after completion of the Phase I expansion projects will amount to 3.77 acres. Phase I of the proposed project falls under two separate task orders, referred to as the northward and westward expansions.

#### Westward Expansion

The larger expansion project will involve increasing the existing pond to provide an additional 6.5 million gallons of recycled waste water and will install a piping system from the pond area to the Beale AFB baseball fields. In order to expedite the expansion, Beale AFB proposes to use an adjacent borrow pit where soil has been excavated and used for past maintenance and repair work

at base landfill areas. The pond will be deepened by 6 feet (ft) and a 60 ft wide area (0.16-acre) between the current pond and the borrow pit will be removed. Excavation will be carried out using excavators, graders, and a dozer.

The current pond ranges from 6 to 12 ft deep; the expansion project will include deepening of the pond to a maximum depth of 12 ft. The contractor will drain the pond and then grade the slopes and the bottom of the pond with a dozer or grader to a smooth surface. The contractor will remove all invasive pond weeds and irregularities of loose material. After the soil has been removed, the contractor will compact the area with a sheep's foot to 90 percent relative compaction. Mechanical aeration equipment will be installed. Aeration will be achieved by "Solar Bee" units, which will be anchored to the bottom of the pond in central locations.

#### Northward Expansion

An additional basin will be located to the north of the current pond and will provide an additional 5.0 million gallons of storage. This portion of the expansion will encompass a 200 ft by 300 ft area (1.37 acres). Excavation will be carried out using excavators, graders, and a dozer and the design will closely resemble the westward expansion project.

#### Drainage Reroute

Adjacent to the excavation site are disturbed wetlands and one un-named, man-made drainage, that runs north to south along A Street and across the project area. Wetlands within 250 ft of the proposed project site are known to be shallow, saturated depressional areas where top soil has been scraped and removed. The un-named drainage is approximately 3 ft deep and 3 ft wide and carries storm water to Hutchinson Creek. Hutchinson Creek lies 2.25 miles (mi) southeast of the site. During storm events, this drainage is full of water moving at high velocity. No listed species of vernal pool crustaceans have been found in these drainages.

The proposed project will re-route the un-named drainage ditch that currently runs north-south, between the pond and the borrow pit. Starting 170 ft north of the northern pond expansion, the drainage will be rerouted as follows: 500 ft to the southeast, 200 ft towards the west, 200 ft south, and 150 ft to the east where it will connect to the original drainage. Impacts to waters of the U.S. total  $\pm 0.043$  acres. To offset the impacts to waters of the U.S. and ensure there is no net loss to those waters, the drainage will be rerouted around the proposed project site and because of the longer route, will increase in overall wetland acreage to approximately  $\pm 0.084$  ac. According to the Clean Water Act Section, Section 404 guidelines, the re-route will result in no loss of waters of the U.S.

#### Conveyance Pipeline

The proposed project includes conveyance pipeline installation in the highly disturbed main base area. The pipeline will provide recycled wastewater for irrigating existing landscaped areas on the main base. The pipeline will be installed along the shoulder of the road, running north on A Street, west on 23<sup>rd</sup> St. to C Street where it will head north to the baseball fields. The trenching will be 3-4 ft deep and 2-3 ft wide. All soil and shoulder base rock will be piled adjacent to the trench and will be returned to the trench upon installation of the pipe. There are 2 disturbed seasonal wetlands within 250 ft of the pipeline locations; both wetlands are located in mowed

areas. Wetland A (0.016 ac) is on the west side of the road 95 ft from the proposed trenching, both A Street and a sidewalk separate the trenching from the wetland. Wetland B (0.008 ac) is 202 feet west of the proposed trenching; a bike path separates the feature from the pipeline.

#### Excess Soil

These projects will generate over 44,000 cubic yards (y<sup>3</sup>) of excess soil. A small amount of the soil will be used at the expansion site to build a berm around the new ponds. The berm will be constructed to satisfy the 2-foot freeboard requirement from the Beale AFB Waste Discharge Requirements (Order No. R5-2004-0045). The Berm will range from 8-10 ft wide at base. This berm will also serve as a road to help ensure that waste water technicians can access all areas of the pond to monitor its condition.

#### Phase II

Phase II of the A Street Pond Expansion will expand the southern edge of the pond and will increase the total capacity to 20 million gallons. The design will match current design plans for Phase I. Phase II had not been funded as of June 2008, but the request for funding has been submitted for fiscal year 2009/2010.

#### Proposed Conservation Measures

The Beale AFB Environmental Flight has identified a series of avoidance, minimization, and compensation measures to be implemented as part of the proposed action. The assessment of the potential impacts of the proposed action is based on the implementation of these measures.

1. A qualified biologist will monitor all construction activities and the proposed work to insure compliance with avoidance, minimization, and compensation components of the proposed project. The biological monitor will:
  - a. Assist construction personnel in compliance with all conservation measures and guidelines.
  - b. Have the authority to stop construction activities if situations arise that could be detrimental to the existing wetlands.
  - c. Allow construction to resume only after corrective actions have alleviated the potential for detrimental activities.
  - d. Be responsible for directing the placement of all stakes, flags, and barriers protecting sensitive resources.
2. The biological monitor will conduct environmental awareness training for construction crews before and during project implementation.
  - a. The education program will briefly cover threatened and endangered species and their habitats that may be encountered during construction or be within close

- proximity of the proposed project sites.
- b. Awareness training will cover all restrictions and guidelines that must be followed by construction crews to avoid or minimize impacts to listed species and their habitat.
- c. Environmental awareness training will be conducted prior to construction, when crews are about to enter potentially sensitive areas and when new personnel join the construction crews.

Restrictions and guidelines to be observed by construction crews include the following:

- a. Construction activities will only be allowed from May 1 to November 15.
  - b. All vehicle operators will observe the posted speed limit on paved roads and a 20-mile per hour limit on unpaved roads.
  - c. Off-road travel by vehicles or construction equipment will be prohibited outside of designated work areas.
  - d. No non-military firearms or pets will be allowed in the proposed action area.
  - e. Motor vehicles and equipment will only be fueled and serviced in designated service areas (on paved surfaces).
  - f. Any worker that inadvertently kills or injures a special status species, or finds one injured or trapped, will immediately report the incident to the biological monitor. The biological monitor will inform Environmental Flight (9 CES/CEV). The 9 CES/CEV will verbally notify the Sacramento Fish and Wildlife Office, Sacramento Valley Branch of the Endangered Species Program within three days and will provide written notification of the incident within five days.
3. Prior to construction, existing vernal pools will be marked on construction drawings. In the field, the biological monitor will:
- a. Direct the installation of orange construction fencing or an equivalent visual barrier along the perimeter of the buffer surrounding the existing vernal pools and swales on the proposed project site in portions that have the potential to support VPTS and VPFS, or their habitat.
  - b. Stake and flag before construction commences to ensure that construction vehicles, equipment, and personnel will not enter areas that have the potential to be occupied by listed species.
  - c. Remove all stakes and flagging within 60 days of construction completion.



4. Threatened and endangered species habitat located adjacent to the construction area will be protected by placing barrier material or stakes and flagging around the perimeter of the wetlands. The location of these barriers will be clearly marked on construction plans and their placement will be supervised by the biological monitor.
5. All construction staging activities will occur within a designated staging area, to be identified by the biological monitor. This site will be located no closer than 250 ft to any existing vernal pool, vernal swale, or other jurisdictional wetlands, and will be marked in the field and on the construction plans. Any spill of hazardous materials will be cleaned up immediately, accordance with all Federal, state, and local regulations.
6. Soil stockpile locations will be placed more than 250 ft from existing wetlands that are not designated for encroachment. Careful application of water to the stockpile's soils will reduce the potential for air quality contamination by fugitive dust. Watering of other exposed soils related to construction activities will be necessary for dust control and soil compaction. Water application will be directed away from existing vernal pools to avoid triggering vernal pool species growth outside of the normal growing season.
7. Additional measures to minimize impacts to the site will be identified in the Storm Water Pollution Prevention Plan (SWPPP), which will be prepared and implemented prior to the initiation of construction. Erosion control Best Management Practices (BMP) will be implemented as needed, including, but not limited to:
  - a. Grading during dry season.
  - b. Compaction of berms and upland spoils.
  - c. Seeding and mulching areas of exposed soil.
8. In areas where jurisdictional wetlands need to be crossed in order to access work areas, a layer of high-tensile strength geotextile fabric will be secured to the bottom of the wetland. Metal AM-2 portable aircraft runway mats supplied by Beale AFB will be placed on the geotextile fabric to facilitate equipment crossing and protect the integrity of the wetland. The crossings will only be wide enough to allow construction equipment to cross the wetland and will be removed after construction activities are complete.
9. The project proponent will avoid and minimize permanent project related impacts to federally-listed species. The project proponent proposes to compensate for the impacts to listed species and their habitats by the proposed project according to the Beale AFB Draft Habitat Conservation Management Plan (HCMP).
  - a. **Preservation component (2:1)** – For every acre of habitat directly or indirectly affected by the proposed project, 2 acres of similar wetland habitat shall be preserved on Beale AFB. A minimum of 0.446 acre of VPFS and VPTS habitat

will be preserved in perpetuity to compensate for the loss of 0.223 acres of habitat (0.162 acres of direct and 0.061 acres of indirect).

- b. **Creation/Restoration component (1:1)** - For every acre of habitat directly affected by the proposed project, 1 acre of similar wetland habitat shall be created/restored and monitored on Beale AFB. A minimum of 0.162 acre of vernal pool habitat will be created/restored, then preserved in perpetuity to compensate for the direct loss of 0.162 acre of habitat.

### **Action Area**

The action area is defined in 50 CFR § 402.02, as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” For the proposed action, the Service considers the action area to be the area bounded on the east by the Golf Course, to the north by Doolittle Drive, to the south by Gavin Mandery Drive, and a line that runs just west of C Street is the western boundary. The land use surrounding the proposed project is predominantly orchard, pasture land, golf course, and a few seasonal wetlands.

The proposed project is centrally located on Beale AFB. The proposed project is within the U.S. Geological Survey 7.5 minute Quadrangles of Wheatland. The Universal Transverse Mercator (UTM) location for the proposed project is 639220 E, 4330083 N, NAD 83.

### **Status of the Species**

#### *Vernal Pool Crustaceans - Vernal Pool Fairy Shrimp (Branchinecta lynchi), and Vernal Pool Tadpole Shrimp (Lepidurus packardii)*

Vernal pool tadpole shrimp were federally listed as endangered, and vernal pool fairy shrimp were federally listed as threatened under the Act, throughout their range in 1994 (59 FR 48153). The vernal pool fairy shrimp is a member of the aquatic crustacean order Anostraca. The vernal pool tadpole shrimp is a member of the aquatic crustacean order Notostraca.

Vernal pool fairy shrimp are found only in ephemeral freshwater habitats in California and Southern Oregon and the vernal pool tadpole shrimp are found only in ephemeral freshwater habitats in California. These species have all evolved similar adaptations to the unique habitat conditions of their vernal pool habitats. The general appearance and life history characteristics of these two species will be described in combination below. Following this description, information pertinent to each species' biology is provided.

#### *Life History and Habitat of Vernal Pool Crustaceans*

Vernal pool fairy shrimp (VPFS) have delicate elongate bodies, large stalked compound eyes, and 11 pairs of phyllopods, or gill-like structures that also serve as legs. They swim or glide gracefully upside down by means of complex beating movements that pass in a wave-like anterior to posterior direction. Fairy shrimp are filter feeders, and consume algae, bacteria,

protozoa, rotifers, and bits of detritus as they move through the water. The second pair of antennae in fairy shrimp adult males are greatly enlarged and specialized for clasping the females during copulation. The females carry eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. After fertilization, the eggs are coated with a protective protein layer that allows them to withstand heat, cold, and prolonged dehydration. These dormant eggs are also known as cysts, and they can remain viable in the soil for decades after deposition. When the pools refill in the same or subsequent seasons, some, but not all, of the cysts may hatch. The cyst bank in the soil may consist of cysts from several years of breeding. The cysts that hatch may do so within days after the vernal pools fill, and rapidly develop into adults. In pools that persist for several weeks to a few months, fairy shrimp may have multiple hatches during a single season (59 FR 48136).

Vernal pool tadpole shrimp (VPTS) have dorsal compound eyes, a large shield-like carapace (shell) that covers most of their body and a pair of long cercopods or appendages at the end of the last abdominal segment. They are primarily benthic (bottom living) animals that swim with their legs down. Vernal pool tadpole shrimp climb or scramble over objects, and plow along bottom sediments as they forage for food. Their diet consists of organic detritus and living organisms, such as fairy shrimp and other invertebrates (Fryer 1987). The females deposit eggs on vegetation and other objects on the pool bottom. Like fairy shrimp, vernal pool tadpole shrimp pass the summer months as dormant cysts in the soil. Some of the cysts hatch as the vernal pool is filled with rainwater in the fall and winter of subsequent seasons, while other cysts may remain dormant in the soil for many years. When winter rains refill inhabited pools, tadpole shrimp reestablish from dormant cysts and may become sexually mature within three to four weeks after hatching (Ahl 1991, Helm 1998). Mature adults may be present in pools until the habitats dry up in the spring (Ahl 1991, Gallagher 1996).

Vernal pool crustaceans breathe primarily through their phyllopods. When dissolved oxygen concentrations are low, fairy shrimp can be seen at the water's surface, circulating oxygen. In addition to phyllopods, fairy shrimp exchange oxygen through other surfaces of their body, particularly the thorax and abdomen (Ericksen and Belk 1999). Oxygen is more readily available in cooler water and oxygen requirements may explain why most species endemic to the Central Valley hatch in the winter and live in cooler water habitats.

The hydrology that maintains the pattern of inundation and drying characteristic of vernal pool habitats is complex. Vernal pool habitats form in depressions above an impervious soil layer (duripan) or rock substrate. After winter rains begin, this impervious layer prevents the downward percolation of water and creates a perched water table causing the depression (or pool) to fill. Due to local topography and geology, the depressions are generally part of an undulating landscape, where soil mounds are interspersed with basins, swales, and drainages (Nikiforoff 1941, Holland and Jain 1978). These features form an interconnected hydrological unit known as a vernal pool complex. Although vernal pool hydrology is driven by the input of precipitation, water input to vernal pool basins also occurs from surface and subsurface flow from the swale and upland portions of the complex (Zedler 1987, Hanes *et al.* 1990, Hanes and Stromberg 1998). Surface flow through the swale portion of the complex allows vernal pool species to move directly from one vernal pool to another. Upland areas are a critical component of vernal

pool hydrology because they directly influence the rate of vernal pool filling, the length of the inundation period, and the rate of vernal pool drying (Zedler 1987, Hanes and Stromberg 1998).

The Service has used vernal pool complexes as the basis for determining populations of vernal pool crustaceans since the species were first proposed for listing. The final rule to list the vernal pool crustaceans states that "The genetic characteristics of the three fairy shrimp and vernal pool tadpole shrimp, as well as ecological conditions, such as watershed contiguity, indicate that populations of these animals are defined by pool complexes rather than by individual vernal pools (Fugate 1992, Fugate 1998, King 1996)". Therefore, the most accurate indication of the distribution and abundance of the vernal pool crustaceans is the number of inhabited vernal pool complexes. Individual vernal pools occupied by the species listed herein are most appropriately referred to as "subpopulations" (FR 59:48137). All of the vernal pool crustacean species addressed in this biological opinion have evolved unique physical adaptations to survive in vernal pools. Vernal pool environments are characterized by a short inundation phase during the winter, a drying phase during the spring, and a dry phase during the summer (Holland and Jain 1978). The timing and duration of these phases can vary significantly from year to year, and in some years vernal pools may not inundate at all. In order to take advantage of the short inundation phase, vernal pool crustaceans have evolved short reproduction times and high reproductive rates. The listed crustaceans generally hatch within a few days after their habitats fill with water, and can start reproducing within a few weeks (Eng *et al.* 1990, Helm 1998, Eriksen and Belk 1999). Vernal pool crustaceans can complete their entire life cycle in a single season, and some species may complete several life cycles. Vernal pool crustaceans can also produce numerous offspring when environmental conditions are favorable. Some species may produce thousands of cysts during their life spans.

To survive the prolonged heat and desiccation of the vernal pool dry phase, vernal pool crustaceans have developed a dormant stage. After vernal pool crustacean eggs are fertilized in the female's brood sac, the embryos develop a thick, usually multi-layered shell. When embryonic development reaches a late stage, further maturation stops, metabolism is drastically slowed, and the egg, now referred to as a cyst, enters a dormant state called diapause. The cyst is then either dropped to the pool bottom or remains in the brood sac until the female dies and sinks. Once the cyst is desiccated, it can withstand temperatures near boiling (Carlisle 1968), fire (Wells *et al.* 1997), freezing, and anoxic conditions without damage to the embryo. The cyst wall cannot be affected by digestive enzymes, and can be transported in the digestive tracts of animals without harm (Horne 1967). Most fairy shrimp cysts can remain viable in the soil for a decade or longer (Belk 1998).

Although the exact signals that cause crustacean cysts to hatch are unknown, factors such as soil moisture, temperature, light, oxygen, and osmotic pressure may trigger the embryo's emergence from the cyst (Brendonck 1996). Because the cyst contains a well developed embryo, the animal can quickly develop into a fully mature adult. This allows vernal pool crustaceans to reproduce before the vernal pool enters the dry phase, sometimes within only a few weeks (Helm 1998, Eriksen and Belk 1999). In some species, cysts may hatch immediately without going through a dormant stage, if they are deposited while the vernal pool still contains water. These cysts are

referred to as quiescent, and allow the vernal pool crustacean to produce multiple generations in a single wet season as long as their habitat remains inundated.

Another important adaptation of vernal pool crustaceans to the unpredictable conditions of vernal pools is the fact that not all of the dormant cysts hatch in every season. Hathaway and Simovich (1996) found that only 6 percent of San Diego fairy shrimp cysts hatched after initial hydration, and only 0.18 percent of Riverside fairy shrimp cysts hatched. The cysts that don't hatch remain dormant and viable in the soil. These cysts may hatch in a subsequent year, and form a cyst bank much like the seed bank of annual plants. The cyst bank may be comprised of cysts from several years of breeding, and large cyst banks of viable resting eggs in the soil of vernal pools containing fairy shrimp have been well documented (Belk 1998). Based on a review of other studies (e.g. Belk 1977, Gallagher 1996, Brendonck 1996), Hathaway and Simovich (1996) concluded that species inhabiting more unpredictable environments, such as smaller or shorter lived pools, are more likely to have a smaller percent of their cysts hatch after their vernal pool habitats fill with water. This strategy reduces the probability of complete reproductive failure if a vernal pool dries up prematurely. This kind of "bet-hedging strategy" has been suggested as a mechanism by which rare species may persist in unpredictable environments (Chesson and Huntly 1989, Ellner and Hairston 1994).

Although the vernal pool crustaceans, and particularly the fairy shrimp, addressed in this biological opinion are not often found in the same vernal pool at the same time, when coexistence does occur, it is generally in deeper, longer lived pools (Eng *et al.* 1990, Thiery 1991, Gallagher 1996, Simovich 1998). In larger pools, closely related species of fairy shrimp may coexist by hatching at different temperatures, and by developing at different rates (Thiery 1991, Hathaway and Simovich 1996). Vernal pool crustacean species may also be able to coexist by utilizing different physical portions of the vernal pool or by eating different food sources (Daborn 1978, Mura 1991, Hamer and Appleton 1991, Thiery 1991). Maeda-Martinez (1997) reviewed much of the literature on large branchiopod coexistence and concluded that species distribution patterns likely result from differences in the physical environment of the ephemeral habitat, differences in the life history and habitat requirements of different species, and factors such as colonization, extirpation, and random events. The role of competition in structuring vernal pool crustacean communities is not well understood.

Upland areas associated with vernal pools are also an important source of nutrients to vernal pool organisms (Wetzel 1975). Vernal pool habitats derive most of their nutrients from detritus which is washed into the pool from adjacent uplands, and these nutrients provide the foundation for vernal pool aquatic communities' food chain. Detritus is a primary food source for the vernal pool crustaceans (Eriksen and Belk 1999).

Vernal pool crustaceans are an important food source for a number of aquatic and terrestrial species. Aquatic predators include insects such as backswimmers (Family Notonectidae) (Woodward and Kiesecker 1994), predaceous diving beetles and their larvae (Family Dystictidae), and dragonflies and damselfly larvae (Order Odonate). Vernal pool tadpole shrimp are another significant predator of fairy shrimp. Vernal pools provide important habitat for resident and migratory birds, particularly waterfowl and shorebirds. Birds are particularly

attracted to the pools because they offer foraging habitat at a time of year when resources are limited (Silveira 1998), and vernal pools help link aquatic resources in the California portion of the Pacific Flyway. Vernal pool crustaceans provide important proteins and calcium vital to the energetic needs of migratory bird migration and reproduction (Proctor *et al.* 1967, Silveira 1998). Vernal pool crustaceans are a major food source for a number of terrestrial vertebrate predators including waterfowl, wading birds, toads, frogs, and salamanders (Proctor *et al.* 1967, Krapu 1974, Swanson 1974, Morin 1987, Simovich *et al.* 1991, Silveira 1998). Vernal pool crustaceans depend on the absence of water during the summer months to discourage aquatic predator species such as bullfrogs, garter snakes, and fish (Eriksen and Belk 1999). There is evidence that vernal pool crustaceans were used as a food source for Native Americans in California's Central Valley.

The primary historic dispersal mechanisms for the vernal pool crustaceans probably consisted of large scale flooding resulting from winter and spring rains, and dispersal by migratory birds. As a result of widespread flood control and agricultural water diversion projects developed during the twentieth century, large scale flooding is no longer a major form of dispersal for the vernal pool crustaceans. When being dispersed by migratory birds, the eggs of these crustaceans are either ingested (Krapu 1974, Swanson 1974, Driver 1981, Ahl 1991) and/or adhere to the bird's legs and feathers where they are transported to new habitats. Cysts may also be dispersed by a number of other species, such as salamanders, toads, cattle, and humans (Eriksen and Belk 1999). Vernal pool crustaceans are often dispersed from one pool to another through surface swales that connect one vernal pool to another. These dispersal events allow for genetic exchange between pools and create a population of animals that extends beyond the boundaries of a single pool. Instead, populations of vernal pool crustaceans are defined by the entire vernal pool complex in which they occur (Simovich *et al.* 1992, King 1996). These dispersal events also allow vernal pool crustaceans to move into pools with a range of sizes and depths. In dry years, animals may only emerge in the largest and deepest pools. In wet years, animals may be present in all pools, or in only the smallest pools. The movement of vernal pool crustaceans into vernal pools of different sizes and depths allows these species to survive the environmental variability that is characteristic of their habitats.

The vernal pool crustaceans addressed in this biological opinion are generally confined to habitats that are low to moderate in alkalinity and dissolved salts, when compared with other aquatic systems (Eriksen and Belk 1999). Although potentially moderated by soil type, vernal pools are generally unbuffered and exhibit wide fluctuations in pH and dissolved oxygen. Vernal pools may change 3 to 4 pH units within a few hours (Keeley and Zedler 1998). Vernal pool water ion concentrations, such as sodium, potassium, calcium, chlorine, and magnesium, also experience large daily and seasonal variations. These variations are due to the concentration of ions as a result of evaporation, and the dilution of ions with additional rainfall throughout the wet season (Barclay and Knight 1981). How vernal pool crustacean species adapt to these fluctuations in water chemistry is unknown. Gonzalez *et al.* (1996) studied ion regulation in several fairy shrimp species in Southern California and found that some species are hyper osmotic regulators, and use active transport to maintain internal ion concentrations above that in the external environment. These species typically inhabit pools with low ion concentrations. Other species can tolerate higher ion concentrations in the external environment by hypo regulating, or maintaining internal levels below that of the water around them. Some species are

also able to osmoconform, and allow their internal chemistry to match external ion concentrations. These differences in ion regulation may explain why some species are limited to certain habitats. Although there are numerous observations of the water chemistry of vernal pools where vernal pool crustaceans have been collected, wide variations in vernal pool water chemistry and the anecdotal nature of these observations preclude definitive conclusions about water chemistry habitat preferences.

#### Additional Information for Vernal Pool Fairy Shrimp and Distribution

Although most species of fairy shrimp look generally similar, vernal pool fairy shrimp are characterized by the presence and size of several bulges on the male's antenna, and by the female's short, pyriform or pear shaped, brood pouch. They vary in size, ranging from 0.4 to 1.0 inch in length (Eng *et al.* 1990).

Vernal pool fairy shrimp generally will not hatch until water temperatures drop to below 50°F (Gallagher 1996, Helm 1998). This species is capable of hatching multiple times within a single wet season if conditions are appropriate. Helm (1998) observed 6 separate hatches of vernal pool fairy shrimp within a single wet season, and Gallagher (1996) observed 3 separate hatches in vernal pools in Butte County.

Helm (1998) observed vernal pool fairy shrimp living for as long as 147 days. The species can reach sexual maturity in as few as 18 days at optimal conditions of 68°F and can complete its life cycle in as little as 9 weeks (Gallagher 1996, Helm 1998). However, maturation and reproduction rates of vernal pool crustaceans are controlled by water temperature and can vary greatly (Eriksen and Brown 1980, Helm 1998). Helm (1998) observed that vernal pool fairy shrimp did not reach maturity until 41 days at water temperatures of 59°F. Vernal pool fairy shrimp has been collected at water temperatures as low as 40°F (Eriksen and Belk 1999), however, the species has not been found in water temperatures above about 73°F (Helm 1998, Eriksen and Belk 1999).

Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools (Eng *et al.* 1990, Helm 1998, CNDDDB 2001). The pool types where the species has been found include Northern Hardpan, Northern Claypan, Northern Volcanic Mud Flow, and Northern Basalt Flow vernal pools formed on a variety of geologic formations and soil types. Although vernal pool fairy shrimp have been collected from large vernal pools, including one exceeding 25 acres in area (Eriksen and Belk 1999), it is most frequently found in pools measuring fewer than 0.05 acre in area (Helm 1998, Gallagher 1996). The species occurs at elevations from 33 feet to 4,003 feet (Eng *et al.* 1990), and is typically found in pools with low to moderate amounts of salinity or total dissolved solids (Keeley 1984, Syrdahl 1993). Vernal pools are mostly rain fed, resulting in low nutrient levels and dramatic daily fluctuations in pH, dissolved oxygen, and carbon dioxide (Keeley and Zedler 1998). Although there are many observations of the environmental conditions where vernal pool fairy shrimp have been found, there have been no experimental studies investigating the specific habitat requirements of this species.

The vernal pool fairy shrimp is known from 32 populations extending from Stillwater Plain in Shasta County through most of the length of the Central Valley to Pixley in Tulare County, and along the central coast range from northern Solano County to Pinnacles National Monument in San Benito County (Eng et al. 1990, Fugate 1992, Sugnet 1993) and a disjunct population on the Agate Desert in Oregon. Five additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County; one in the mountain grasslands of northern Santa Barbara County; one on the Santa Rosa Plateau in Riverside County, one near Rancho California in Riverside County and one on the Agate Desert near Medford, Oregon. Three of these isolated populations each contain only a single pool known to be occupied by the vernal pool fairy shrimp.

#### Additional Information for Vernal Pool Tadpole Shrimp and Distribution

Vernal pool tadpole shrimp are distinguished by a large, shield-like carapace, or shell, that covers the anterior half of their body. They resemble horse shoe crabs. Vernal pool tadpole shrimp have 30 to 35 pairs of phyllopods, a segmented abdomen, paired cercopods or taillike appendages, and fused eyes. Vernal pool tadpole shrimp will continue to grow as long as their vernal pool habitats remain inundated, in some cases for six months or longer. They periodically shed their shells, which can often be found along the edges of vernal pools where vernal pool tadpole shrimp occur. Mature vernal pool tadpole shrimp range in size from 0.6 to 3.4 inches in length.

Vernal pool tadpole shrimp have relatively high reproductive rates. Ahl (1991) found that fecundity increases with body size. Large females, greater than .8 inch carapace length, could deposit as many as 6 clutches, averaging 32 to 61 eggs per clutch, in a single wet season. Vernal pool tadpole shrimp sex ratios can vary (Ahl 1991, Sassaman 1991).

After winter rains fill their vernal pool habitats, dormant vernal pool tadpole shrimp cysts may hatch in as little as 4 days (Ahl 1991, Rogers in litt. 2001). Additional cysts produced by adult tadpole shrimp during the wet season may hatch without going through a dormant period (Ahl 1991). Vernal pool tadpole shrimp emerge from their cysts as metanaupliu, a larval stage which lasts for 1.5 to 2 hours. Then they molt into a larval form resembling the adult.

Helm (1998) found that vernal pool tadpole shrimp took a minimum of 25 days to mature and the mean age at first reproduction was 54 days. Other researchers have observed that vernal pool tadpole shrimp generally take between 3 and 4 weeks to mature (Ahl 1991, King 1996). Ahl (1991) found that reproduction did not begin until individuals were larger than 0.39 inch carapace length. Variation in growth and maturation rates may be a result of differences in water temperature, which strongly influences the growth rates of aquatic invertebrates.

Vernal pool tadpole shrimp will survive for as long as their habitats remain inundated, sometimes for 6 months or more (Ahl 1991, Gallagher 1996, Helm 1998). They continue growing throughout their lives, periodically molting their shells. These shells can often be found in vernal pools where the species occurs. Vernal pool tadpole shrimp hatching is temperature dependent. Optimal hatching occurs between 50° and 59° F, while hatching rates become significantly lower at temperatures above 68°F (Ahl 1991).



Vernal pool tadpole shrimp occur in a wide variety of vernal pool habitats including vernal pools, clay flats, ephemeral stock ponds, roadside ditches, and road ruts (Helm 1998, Jones & Stokes 2002). They have been found in pools with water temperatures ranging from 50° F to 84°F and pH ranging from 6.2 to 8.5 (Syr Dahl 1993, King 1996). However, vernal pools exhibit daily and seasonal fluctuations in pH, temperature, dissolved oxygen, and other water chemistry characteristics (Syr Dahl 1993, Scholnick 1995, Keeley 1998). Determining vernal pool tadpole shrimp habitat requirements is not possible based on anecdotal evidence, and the tolerances of this species to specific environmental conditions have yet to be determined. Although vernal pool tadpole shrimp are found on a variety of geologic formations and soil types, Helm (1998) found that over 50 percent of vernal pool tadpole shrimp occurrences were on High Terrace landforms and Redding and Corning soils. Plantenkamp (1998) found that vernal pool tadpole shrimp presence differed significantly between geomorphic surfaces at Beale Air Force Base and the species was most likely to be found on Riverbank formation.

Vernal pool tadpole shrimp can be difficult to detect because of the animals' habit of dwelling on muddy pool bottoms, where they may burrow through vegetative layers. Additionally, eggs may lay dormant for as long as four years, for this reason populations may go undetected through one or two years of wet season sampling (Rogers 2001).

King (1996) studied genetic variation among vernal pool tadpole shrimp populations at 20 different sites in the Central Valley. She found that 96 percent of the genetic variation measured was due to differences between sites. This result corresponds with the findings of other researchers that vernal pool crustaceans have low rates of gene flow between separated sites. The low rate of exchange between vernal pool tadpole shrimp populations is probably a result of the spatial isolation of their habitats and their reliance on passive dispersal mechanisms. However, King (1996) also estimated that gene flow between pools within the same vernal pool complex was much higher, and concluded that vernal pool crustacean populations should be defined by vernal pool complex, not by the boundaries of an individual vernal pool.

Based on genetic differences, King (1996) separated vernal pool tadpole shrimp populations into two distinct groups. One group was comprised of animals inhabiting the floor of the Central Valley, near the Sacramento and San Joaquin Rivers. The other group contained vernal pool tadpole shrimp from sites along the eastern margin of the valley. King (1996) concluded that these two groups may have diverged because cyst dispersal by overland flooding historically connected populations on the valley floor, while populations on the eastern margin of the valley were not periodically connected by large scale flooding, and were therefore historically more isolated. When dispersal of these foothill populations occurred, it was probably through different mechanisms such as migratory birds. King (1996) also found that populations in eastern Merced County, in the vicinity of the Flying M Ranch and the University of California (UC) Merced campus, were very different from all other populations studied. She concluded, particularly because it is found on very ancient soils, that this group may have been isolated from other populations very early.

The vernal pool tadpole shrimp is sparsely distributed along the Central Valley from east of Redding in Shasta County south to Fresno County, and in a single vernal pool complex located

on the San Francisco Bay National Wildlife Refuge in Alameda County. It inhabits vernal pools containing clear to highly turbid water, ranging in size from 5 square meters (54 square feet) in the Mather Air Force Base area of Sacramento County, to the 36-hectare (89-acre) Olcott Lake at Jepson Prairie in Solano County.

#### *Vernal Pool Fairy Shrimp and Tadpole Shrimp Critical Habitat*

Critical habitat for the vernal pool fairy shrimp and the vernal pool tadpole shrimp was designated on August 6, 2003 (68 FR 46684) and finalized on February 10, 2006 (71 FR 7118). In determining which areas to designate as critical habitat, the Service considers those physical and biological features (primary constituent elements) that are essential to the conservation of the species, and that may require special management considerations and protections (50 CFR 424.14). This proposed project is located outside of designated critical habitat for the vernal pool fairy shrimp and the vernal pool tadpole shrimp.

#### **Environmental Baseline**

Regulations implementing the Act (50 CFR §402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated effects of all proposed Federal projects in the action area that have undergone section 7 consultation and the effects of State and private actions that are contemporaneous with the consultation in progress.

#### *Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp*

The vernal pool fairy shrimp and vernal pool tadpole shrimp are imperiled by habitat loss caused by a variety of human-caused activities, primarily urban development, water supply/flood control projects, and conversion of land to agricultural use. Only small proportions of the habitats of these crustaceans are protected from these threats. State and local laws and regulations have not been adequate to protect the listed vernal pool crustaceans. Other regulatory mechanisms necessary for the conservation of the habitat of the vernal pool fairy shrimp and the vernal pool tadpole shrimp have proven ineffective.

Holland (1978) estimated that between 67 and 88 percent of the area within the Central Valley of California which once supported vernal pools had been destroyed by 1973. However, an analysis of this report by the Service revealed apparent arithmetic errors which resulted in a determination that a historic loss between 60 and 85 percent may be more accurate. In the ensuing 23 years a substantial amount of vernal pool habitat was converted for human uses. For example, the Corps' Sacramento District authorized the filling of 189 hectares (467 acres) of wetlands between 1987 and 1992 pursuant to Nationwide Permit 26 (USFWS 1992). The Service estimates that a majority of these wetland losses within the Central Valley involved vernal pools.

Current rapid urbanization and agricultural conversion throughout the ranges of the species continue to pose the most severe threats to the continued existence of the fairy shrimp. The rate of loss of vernal pool habitat in the state has been estimated at 2 to 3 percent per year (Holland

and Jain 1988). Rapid urbanization of the Central Valley of California currently poses the most severe threat to the continued existence of the vernal pool fairy shrimp. The vernal pools under the jurisdiction of the Sacramento District of the U.S. Army Corps of Engineers include most of the known populations of the vernal pool fairy shrimp and the vernal pool tadpole shrimp (Coe 1988). Coe (1988) estimated that within 20 years, 60 to 70 percent of the habitat would be destroyed by human activities.

The habitat of the listed vernal pool crustaceans is highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. This fragmentation results in small isolated vernal pool fairy shrimp and vernal pool tadpole shrimp populations. Ecological theory predicts that such populations will be highly susceptible to extinction due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soule 1986; Goodman 1987a, b). Should an extinction event occur in a population that has been fragmented, the opportunities for re-colonization are thought to be greatly reduced due to geographical isolation from other source populations.

The ephemeral wetlands that support this network of occurrences are remnants of formerly pristine vernal pool ecosystems that have been converted primarily to agricultural and urban uses. The highly disturbed remnant habitat is generally not protected and the existing populations of the listed vernal pool crustaceans are imperiled by numerous human activities. These activities include excavations and maintenance procedures that alter local hydrological conditions, conversion of grasslands to agriculture, and activities that result in the introduction of toxic substances (*e.g.*, pesticides and spills, illegal dumping of hazardous materials).

Yuba County contains occurrences of both the vernal pool tadpole shrimp and vernal pool fairy shrimp, although much of the terrain in southern Yuba County has been converted to active agriculture, including rice farming and orchards. In the late 1990s, Holland (1998) identified over 8,000 acres of remnant vernal pool habitat east and southeast of Marysville between the Yuba and Bear Rivers and outside of Beale AFB. The largest remaining blocks of extant vernal pool habitat occur primarily on, and adjacent to, Beale AFB, and comprise the bulk of the Beale Core Recovery Area, which is the northernmost core recovery area in the Southeastern Sacramento Valley vernal pool region. Vernal pools on Beale AFB occur predominantly in the western, central, and southern portions of the base (Sawyer and Keeler-Wolf 1995) and comprise roughly 3,900 acres of vernal pool habitat (Holland 1998). In a 1996 study of 1000 vernal pools occurring on five geomorphic soil-types that occur on Beale AFB, vernal pool tadpole shrimp adults were found in 21 vernal pools on Riverbank and two vernal pools on Modesto soil types. Active vernal pool fairy shrimp were found in 134 pools (Jones and Stokes 1998b); in 20 percent of pools with Laguna and Riverbank soils and in 13 percent of Modesto soil types (Platenkamp 1998). Increased vernal pool depth had a positive effect and increased vernal pool surface area had a negative effect on the frequency of active vernal pool fairy shrimp, while active vernal pool tadpole shrimp were more frequent in pools with larger surface areas (Platenkamp 1998). Subsequent wet and dry-season surveys have also been conducted at Beale AFB, in which listed vernal pool crustaceans have been located within close proximity to the project action area. The Service has not determined whether occurrences are known from vernal pools either partially or wholly within 250 feet of the project footprint.

Within the project vicinity, the Service has issued biological opinions primarily to cover losses of vernal pool complexes and depressional seasonal wetlands that provide suitable habitat for federally-listed vernal pool crustaceans at Beale AFB. Implementation of the Beale AFB General Plan is expected to result in the potential loss of up to 28.51 acres or more of existing seasonal wetland habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp. To compensate for project effects, Beale AFB has committed to preservation of approximately 81.84 wetted vernal pool acres and restoration of 31.629 wetted vernal pool acres for proposed projects that have been subject to these biological opinions. Beale AFB has identified three vernal pool preservation areas, one vernal pool restoration area, and two vernal pool construction areas to compensate for losses of, and adverse effects to, the vernal pool tadpole shrimp and vernal pool fairy shrimp. In 2001, Beale AFB completed Phase 1 of vernal pool restoration work in the Vernal Pool Restoration Area on the western side of Beale AFB by creating a little over 16.24 wetted acres of vernal pools. In 2005, Beale AFB created an additional 12.3 acres (Phase 2) contiguous to the Phase 1 restoration site. In 2007, Beale AFB restored 3.8 acres of vernal pools at a site located to the east of S. Beale Road, at Beale's southwest corner. Restoration was conducted on land that was used for rice production, but that retained a signature of the previous vernal pool habitat. Beale AFB consulted with the Service on construction of an emergency Homeland Security fence in 2004 (BO # 1-1-04-F-0294), in which the base compensated for construction effects of installing a chain-link fence on vernal pool habitat along the western perimeter of the Base. The AFB compensated for effects to vernal pools located wholly or partially within 50 feet of the fence line. The action area of the proposed project overlaps a small portion of the area along Gavin Mandery Drive in which the fence was installed, and for which Beale AFB provided compensation.

In addition, lands between Beale AFB and the towns of Linda and Olivehurst are undergoing rapid development. These developments and others within the region, have resulted in both direct and indirect effects to vernal pools, and have contributed to the decline in vernal pool fairy shrimp and vernal pool tadpole shrimp. Portions of the privately-owned lands have vernal pools present, although the extent of suitable habitat for listed crustaceans is not fully known. Private lands to the west and southwest of the base have been used historically for various forms of agriculture, including extensive holdings contoured for rice farming. Lands to the north of the base (between Beale AFB and the Yuba River) were subject to historical dredging activities and current aggregate mining. There have been few known surveys for vernal pool crustaceans outside of Beale AFB lands; therefore, the extent to which vernal pool habitat has been altered by agriculture and mining activities in the surrounding area appears to be largely unknown.

*Factors Affecting the Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp within, and Adjacent to the Action Area*

A number of State, local, private, and unrelated Federal actions have occurred within the action area and adjacent region affecting the environmental baseline of the two species. Some of these projects have been subject to prior section 7 consultation. These actions have resulted in both direct and indirect effects to vernal pool habitat within the region. Projects affecting the environment in and around the action area include the developments at Beale AFB, gravel mining north of the project along the Yuba River, new development to the west of the project in

the Olivehurst area and to the south in the Wheatland area, and new development in Placer County. Conversion of un-irrigated land to agriculture is likely the most prominent factor affecting these species within the action area itself. South of Beale AFB, along Spenceville Road just east of Wheatland, landowners have submitted preliminary plans to Yuba County to convert 3,300 acres to a mixed-use development project with approximately 9,400 residential units and approximately 300 acres of commercial development (Laughlin 2007, Shaw 2007). In addition, vernal pool habitat along the perimeter of Beale AFB has been affected to an unknown extent by past disking of the Base perimeter during the dry season for fire control purposes. Remaining vernal pool habitat on some private lands has been altered by agricultural run-off that has lengthened the wetted period beyond that characteristic of vernal pools; however, the acreage of pools affected has not been quantified.

### **Effects of the Proposed Action**

#### *Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp Direct and Indirect Effects*

Direct effects are the effects of the action that would directly affect the species, for example, those actions that would immediately destroy or adversely affect habitat or displace animals and plants. Individuals of listed crustaceans and their cysts may be directly injured or killed by activities leading to the destruction (i.e. filling of, or otherwise destruction) of habitat in which they live. The Service maintains that the partial filling of a vernal pool directly affects the whole vernal pool. The BA indicates that no habitat for vernal pool crustaceans occurs within the project footprint. Although several depressional seasonal wetlands are within, and abut the project footprint, these wetlands may exhibit inconsistent inundation, and no longer comprise suitable habitat for the vernal pool fairy shrimp or the vernal pool tadpole shrimp. No other vernal pool or seasonal wetland features are identified within or abutting the project footprint. However, results from the 2008 dry-season survey show the presence of both *Branchinecta* and *Lepidurus* in the landscape immediately surrounding the proposed project, and there are no physical barriers that separate the locations where crustacean cysts were found and the proposed project. The project proponents have proposed avoidance and minimization measures that will prevent effects of project construction beyond the project footprint, and have proposed compensation for impacted wetlands that will be affected both directly and indirectly. Therefore, the proposed project will result in direct effects to 0.162 acre of vernal pool habitat for the two federally-listed vernal pool crustaceans.

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the action. Vernal pool habitat indirectly affected includes all habitat supported by destroyed upland areas and swales, and all habitat otherwise damaged by changes to the watershed, human intrusion, introduced species, and disturbance that will be caused by the project.

Based on the available information, the Service has determined the 0.061 acres of adjacent vernal pools within 250 feet will be indirectly affected by the proposed project. Beale AFB has proposed to compensate for effects to a combined total of 0.223 acres of vernal pool habitat.

The proposed project may have impacts on the hydrology of the nearby habitat (e.g. pools and swales) and surrounding areas. The construction of an unlined pond, construction of pond berms and roadways, and construction of pumping facilities and associated pads can affect the amount and quality of water available to the surface water and/or perched water tables characteristic of vernal pool areas. Although perched groundwater may be encountered in local lenses of granular materials along the project alignment (Taber Consultants 2006), the magnitude and effect of future seepage from or to the unlined pond is unknown. Changes to the perched water table can lead to alterations in the rate, extent, and duration of inundation of remaining habitat. The biota of vernal pools and swales can change when the hydrologic regime is altered (Bauder 1987). Survival of aquatic organisms such as vernal pool fairy shrimp and tadpole shrimp is directly linked to the water regime of their habitat (Zedler 1987). Therefore, development of projects that alter water relationships near to vernal pool areas may, at times, result in the failure of local sub-populations of vernal pool organisms, including vernal pool fairy shrimp and vernal pool tadpole shrimp. Changes in hydrology may also result in the replacement of one vernal pool crustacean species with another.

The use of pesticides and/or herbicides along the pond shoreline may have adverse effects on nearby listed vernal pool crustaceans and their cysts. Individuals may be killed directly or suffer reduced fitness through physiological stress or a reduction in their food base due to the presence of these chemicals. The introduction of a permanent water feature in close proximity to vernal pool habitat provides a potential source for several non-native predators of vernal pool crustaceans. Bullfrogs are known to consume vernal pool tadpole shrimp (Service 1994; Balfour and Morey 1990), and opportunities for bullfrog dispersal into vernal pool ecosystems have increased as additional permanent-water habitat has been created in ponds, canals, and in streams augmented by urban runoff and irrigated agriculture.

### **Cumulative Effects**

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Continued base expansion and development will likely occur in the foreseeable future, and will continue to pressure the remaining vernal pool habitat that is not protected. Infrastructure repair and expansion, expansion of the existing golf course, or changes in the hydrology could all contribute to future adverse effects to the remaining wetlands within the action area.

The cumulative effects of all the future State, Tribal, local, and private actions that are reasonably certain to occur in the action area will continue to have a deleterious effect on the reproduction, numbers, and distribution of federally-listed species. The adverse cumulative effects described in this section serve to magnify the adverse effects of the proposed action and diminish any beneficial effects.

## Conclusion

### Analytical Framework for the Jeopardy/No Jeopardy Determination

The following analysis relies on four components to support the jeopardy/no jeopardy determination for the species that may be affected by the proposed project: 1) the *Status of the Species*, which evaluates the species' range-wide condition, the factors responsible for that condition, and its survival and recovery needs; 2) the *Environmental Baseline*, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the role of the action area in the species' survival and recovery; 3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the species; and 4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species. In accordance with the implementing regulations for section 7 and Service policy, the jeopardy/no jeopardy determination is made in the following manner: the effects of the proposed Federal action are evaluated with the aggregate effects of everything that has led to the species' current status and, for non-Federal activities in the action area, those actions likely to affect the species in the future, to determine if, given the aggregate of all of these effects, implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the species and the role of the action area in meeting those needs as the context for evaluating the effects of the proposed Federal action combined with other relevant effects. In short, a non-jeopardy determination is warranted if the proposed action is consistent with maintaining the role of habitat and the species population in the action area for the survival and recovery of the species.

After reviewing the current status of the vernal pool tadpole shrimp, and the vernal pool fairy shrimp, the environmental baselines for the action area covered by this biological opinion, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the proposed A Street Pond Expansion Project, as proposed, is not likely to jeopardize the continued existence of these two species. The proposed project is not likely to destroy or adversely modify designated critical habitat for either the vernal pool tadpole shrimp or the vernal pool fairy shrimp because no critical habitat for these species has been designated or proposed within the action area of the proposed project.

## INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an

extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The U.S. Air Force and Beale AFB, have a continuing duty to regulate the activity covered by this incidental take statement. If Beale AFB (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

#### **Amount or Extent of Take**

##### *Vernal Pool Crustaceans*

Construction activities associated with the proposed project will indirectly affect 0.061 acre, and directly affect 0.162 acre of seasonal wetland and result in the take of the vernal pool tadpole shrimp and the vernal pool fairy shrimp. The Service anticipates incidental take of these two listed vernal pool crustaceans will be difficult to detect or quantify for the following reasons:

1. The aquatic nature of the organisms and their relatively small body size makes the finding of a dead specimen unlikely.
2. Losses may be masked by seasonal fluctuations in numbers and other causes.
3. The species occurs in habitat that makes them difficult to detect.

Due to the difficulty in quantifying the number of vernal pool fairy shrimp and vernal pool tadpole shrimp that will be killed as a result of the proposed action, the Service is quantifying take incidental to the project as the number of acres of vernal pool crustacean habitat that will become unsuitable for the listed species due to indirect affects as a result of the proposed project. Therefore, the Service estimates that all vernal pool fairy shrimp and vernal pool tadpole shrimp inhabiting 0.223 acre of vernal pool crustacean habitat will become harassed, harmed, injured, or killed as a result of the proposed project.

Upon implementation of the following reasonable and prudent measures, incidental take associated with the proposed project on the two vernal pool crustaceans in the form of harm, harassment, or death from habitat loss, injury, or direct mortality will become exempt from the



prohibitions described under section 9 of the Act for direct and indirect effects. The incidental take associated with the proposed project is hereby exempted from prohibitions of take under section 9 of the Act.

### **Effect of Take**

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the vernal pool tadpole shrimp, and/or the vernal pool fairy shrimp. The proposed project is not likely to destroy or adversely modify designated critical habitat for either the vernal pool tadpole shrimp or the vernal pool fairy shrimp because no critical habitat for these species has been designated or proposed within the action area of the proposed project.

### **Reasonable and Prudent Measures**

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the effects of take on the listed species that may be affected by the proposed project:

1. Take in the form of harassment and/or harm of vernal pool crustaceans during construction activities associated with implementing the project shall be minimized.
2. The permanent and temporary loss and degradation of habitats of vernal pool crustaceans shall be confined to the proposed project site and minimized, and then restored to the greatest extent practicable.

### **Terms and Conditions**

In order to be exempt from the prohibitions of section 9 of the Act, Beale AFB must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The following Terms and Conditions implement Reasonable and Prudent Measure one (1):
  - A. Beale AFB shall minimize the potential for harm or harassment of the vernal pool tadpole shrimp and vernal pool fairy shrimp resulting from the project related activities by implementation of the conservation measures as described in the biological assessment (section 5), and the *Project Description* of this biological opinion (pages 4-7).
  - B. Beale AFB shall include Special Provisions that include the avoidance and minimization measures of this biological opinion in the solicitation for bid information.

- C. Beale AFB will educate and inform contractors involved in the project as to the requirements of the biological opinion.
- D. As described in the biological assessment and the June 17, 2008, electronic mail, Beale AFB shall compensate for permanent impacts to vernal pool tadpole shrimp and vernal pool fairy shrimp habitat by preserving 0.446 acre and create/restore 0.162 acre of vernal pool habitat prior to ground-breaking.
- E. A Beale AFB biologist shall have oversight over implementation of all the measures described in the *Terms and Conditions* of this biological opinion, and he/she shall have the authority to stop project activities, through communication with the Resident Engineer, if any of the requirements associated with these measures are not being fulfilled. If the biologist/construction liaison has requested a stop work due to unauthorized take of any listed species, the Service and the California Department of Fish and Game will be notified within one (1) day via email or telephone. The Service contact is the Deputy Assistant Field Supervisor, Endangered Species Program at the Sacramento Fish and Wildlife Office at telephone 916-414-6600. California Department of Fish and Game contact is at (916) 654-4262.
- F. Permanent and temporary construction disturbances and other types of project related disturbances to listed species habitat shall be minimized to the maximum extent possible. To minimize temporary disturbances, all project-related vehicle traffic shall be restricted to established roads, construction areas, and other designated areas.
- G. Project employees shall be directed to exercise caution when commuting within the action area. A 20-mile per hour speed limit will be strongly encouraged on unpaved roads within listed species habitats.
- H. No canine or feline pets or firearms (except for Federal, State, or local law enforcement officers and security personnel) shall be permitted on construction sites to avoid harassment or killing or injuring of listed species.
- I. All construction activity shall be confined within the project site, which may include temporary access roads, haul roads, and staging areas specifically designated and marked for these purposes. At no time shall equipment or personnel be allowed to adversely affect habitat areas outside the project site without authorization from the Service.
- J. The Resident Engineer or their designee shall be responsible for implementing these conservation measures and shall be the point of contact for each project.

K. If borrow material is going to be used for the A Street Pond Expansion Project, Beale AFB shall follow the procedures outlined below:

1. Beale AFB shall require as part of the construction contract that all contractors comply with the Act in the performance of the work necessary for project completion performed inside and outside the project action area.
2. Beale AFB shall require documentation from the contractor that aggregate, fill, or borrow material provided for each project was obtained in compliance with the Act. Evidence of compliance with the Act shall be demonstrated by providing the Resident Engineer any one of the following:
  - a. A letter from the Service stating use of the borrow pit area will not result in the incidental take of listed species;
  - b. An incidental take permit for contractor-related activities issued by the Service pursuant to section 10(a)(1)(B) of the Act;
  - c. A biological opinion or a letter concurring with a "not likely to adversely affect" determination issued by the Service to the Federal agency having jurisdiction over contractor-related activities;
  - d. A letter from the Service concurring with the "no effect" determination for contractor-related activities; or
  - e. Contractor submittal of information to the proposed project Resident Engineer indicating compliance with the State Mining and Reclamation Act (SMARA) and providing the County land use permits and CEQA clearance.
  - f. If a borrow site that is in compliance with the Act is not available, Beale AFB will either:
    - i. Identify/select a site that the Service has concurred with the "no effect" determination, or;
    - ii. Request reinitiation of formal consultation on the action considered herein based on new information.

2. The following Terms and Conditions implement Reasonable and Prudent Measure two (2):

- A. If requested, before, during, or upon completion of ground breaking and construction activities, Beale AFB shall allow access by Service and/or California Department of Fish and Game personnel to the project site to inspect project effects to the vernal pool tadpole shrimp and vernal pool fairy shrimp, and their habitat.

- B. Beale AFB shall comply with the *Reporting Requirements* of this biological opinion.

### **Reporting Requirements**

All documents submitted to the Service concerning this project shall reference the file number 81420-2008-F-1076.

1. A post-construction report detailing compliance with the project design criteria described under the *Description of the Proposed Action* section of this biological opinion shall be provided to the Service within 30 calendar days of completion of the project.
2. Beale AFB shall notify the Service via electronic mail and telephone within one (1) working day of the death or injury to a listed species that occurs due to project related activities or is observed at the project site. Notification must include the date, time, location of the incident or of the finding of a dead or injured animal, and photographs of the specific animal. In the case of an injured animal, the animal shall be cared for by a licensed veterinarian or other qualified person. In the case of a dead animal, the individual animal should be preserved, as appropriate, and held in a secure location until instructions are received from the Service regarding the disposition of the specimen or the Service takes custody of the specimen. Any dead specimen shall be handled only by a valid 10(a)(1)(A) permit holder, and shall be disposed with according to the 10(a)(1)(A) permit instructions. The Service contacts are the Sacramento Valley Branch of the Endangered Species Program at (916) 414-6645, and the Resident Agent-in Charge (Office of Law Enforcement) at (916) 414-6660. The California Department of Fish and Game contact is at (916) 654-4262.
3. Any contractor or employee who, during routine operations and maintenance activities inadvertently kills or injures a State listed wildlife species shall immediately report the incident to her or his supervisor or representative. The supervisor or representative must contact the California Department of Fish and Game immediately in the case of a dead or injured State listed wildlife species. The California Department of Fish and Game contact for immediate assistance is State Dispatch at (916) 445-0045.
4. The Service shall be notified immediately if any dead or sick listed wildlife species is found in or adjacent to pesticide-treated areas. Cause of death or illness, if known, also should be conveyed to this office. The appropriate contact is SFWO Contaminants at (916) 414-6590.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a) (1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can

be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of informational databases.

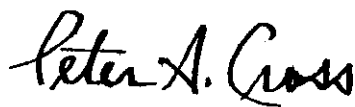
- Beale AFB personnel or their consultants should continue monitoring created/restored vernal pools on Beale AFB, and publish the results in peer reviewed sources.
- Beale AFB should develop a programmatic biological opinion in coordination with the Service to cover activities on Beale AFB that may affect vernal pool crustaceans.

### REINITIATION

This concludes formal consultation on the proposed South A Street Pond Expansion Project, Beale AFB, in Yuba County, California. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion on the proposed A Street Pond Expansion Project, please contact Richard Montgomery or the Chief, Sacramento Valley Branch, at the letterhead address or at telephone 916/414-6645.

Sincerely,



Peter A. Cross  
Deputy Assistant Field Supervisor

cc:

Kirsten Christopherson, Beale AFB, CA  
Jamie Visinoni, Beale AFB, CA  
James Navicky, CDFG, CA

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## **Appendix C**

### **Public Involvement**

# APPEAL-DEMOCRAT

1530 Ellis Lake Drive, P.O. Box 431, Marysville, CA 95901  
(530) 741-2345

## Affidavit of Publication

(2015.5 C.C.P)

STATE OF CALIFORNIA,

Counties of Yuba and Sutter

9<sup>th</sup> CES Environmental Flight

Multi Project Environmental

I am not a party to, nor interested in the above entitled matter. I am the principal clerk of the printer and publisher of THE APPEAL-DEMOCRAT, a newspaper of general circulation, printed & published in the City of Marysville, County of Yuba, to which Newspaper has been adjudged a newspaper of general circulation by The Superior Court of the County of Yuba, State of California under the date of November 9, 1951, No. 11481, and County of Sutter to which Newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Sutter, State of California under the date of May 17, 1999, Case No. CV PT99-0819 that the notice of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

August 20, 2007

I declare under penalty of perjury  
that the foregoing is true and correct.  
Executed at Marysville, California

August 20, 2007

Date:

Nancy Braun  
(Signature)

This space is for the County Clerk's filing stamp.

## PROOF OF PUBLICATION

### PUBLIC NOTICE

#### MULTI-PROJECT ENVIRONMENTAL ASSESSMENT (EA) FOR BEALE AFB, CA

The U.S. Air Force at Beale Air Force Base (AFB), California, proposes to implement 8 construction, repair, upgrade and enhancement projects throughout Beale AFB. The Multi-Project EA is a collective analysis of these 8 projects planned for implementation during the years 2007 and 2008. The Multi-Project EA is a tool to analyze development projects in support of current and future mission requirements. The objective of the EA is to disclose and analyze potentially significant environmental impacts. In accordance with the National Environmental Policy Act (NEPA), the Air Force is required to prepare an Environmental Assessment (EA), and provide documentation to the public for review.

The review period for this EA is thirty (30) days. The document will be available for review at the Beale AFB Environmental Flight office, 6601 B Street for 30 days from the date of this publication. Copies may also be obtained by calling (530) 634-2844.

August 20

Ad #00024638

## COMMUNITY from page 5

missary. For more information, call the thrift shop at 634-1893, during business hours.

### Munitions storage area closure

The 9th Munitions Squadron munitions storage area will be closed for a 100 percent semi-annual inventory from Sept. 10 to 14. For emergency support during this time, call 634-9050.

### Sponsorship training

Moving to a new duty location can be stressful. Sponsors can help Airmen adjust to their new duty assignment. For more information on becoming a sponsor, call the Airman and Family Readiness Center at 634-2863. Training is scheduled for every Thursday from 3 to 3:30 p.m.

### Airmen's Attic

The Airmen's Attic is open Mondays, Wednesdays and Fridays from 10 a.m. to 2 p.m.; Tuesdays and Thursdays from 5 to 7 p.m.; and the last Saturday of each month from 10 a.m. to noon. The attic has re-located its office behind the Omni. An all-ranks day is scheduled for today and the last Friday of each month. The attic is doubling the number of items customers can take. The attic has many adult and children's clothing items, shoes, as well as uniforms. For more information, call the attic at 634-5640. The attic will be closed from Aug. 31 to Sept. 9.

### Breastfeeding support group

A free breastfeeding support group is open to all women and children Mondays

at 9:30 a.m. in the Foothills Chapel.

For more information, call Julie Mathews at 788-7660.

### OB Orientation

Obstetrician Orientation, the class for expecting parents, is held the third Wednesday of every month from 9 a.m. to noon in the clinic conference room. The class is open to all ranks and provides information and resources pertaining to prenatal care, nutrition, exercise, breastfeeding, and Tricare coverage. For more information, call 634-0626.

### Personal property information

The TMO Personal Property Element operates on an appointment basis to provide better service. For inbound shipments, the PPE does not have authority to arrange for delivery, the Joint Personal Property Shipping office in Colorado Springs manages all deliveries and can be reached at 1-800-771-1819. Upon arrival at Beale, new members should contact the TMO element to update personal contact information. They should then call JPPSO-COS to arrange delivery. For outbound household goods needs, and local moves (between base housing and downtown or base housing to base housing), call 634-2932 or 634-2936 to set up an appointment with a counselor. All paperwork will be completed during the appointment to eliminate multiple trips and then forwarded to JPPSO-COS to set up the packing and pickup date. Appointments are available from 8:30 to 11:30 a.m. and 1 to 3 p.m. Mondays through Fridays. The office is closed from noon

to 1 p.m. Walk-in hours are 7:30 to 8:30 a.m., Mondays, Tuesdays, and Fridays and 3:30 to 4:30 p.m. Mondays through Fridays. For more information, call 634-2932 or 634-2936.

### Military personnel records

All customers requesting copies of, or access to, their military personnel record must have their Common Access Card in their possession. Positive identification is mandatory prior to giving access. Also, only first-line supervisors may view the UPRG on their subordinates; a supervisor's supervisor may not.

Orderly room personnel must be, and are, designated by letter signed by the commander to obtain copies or sign out the UPRG. Individuals requesting multiple copies of documents should submit a request via e-mail to 9sds.uprg@beale.af.mil. Copies will be available for pickup within two business days.

Due to workload customers making the request in person may be asked to come back to pick copies up. For more information, call 634-5134.

### Beale Cub Scout Pack 64

Beale's Cub Scout Pack 64 is now taking registrations for new Boy Scouts from first to fifth grade for the 2007 and 2008 Cub Scout Program.

A registration event will be held Sept. 13 from 6 to 7:30 p.m. at the Community Center. The pack is also seeking adult volunteers to serve as den leaders and in committee chair positions.

For more information, call Cubmaster

Shane Griego at 632-8968.

### Available NAF positions

The following Non-Appropriated Fund positions are currently available at Beale: Child development program assistant, food service worker, cashier and checker, waiter, sundry clerk, custodial worker leader, recreation assistant, recreation aid, lodging clerk, bartender, cook, desk clerk, custodial worker, laborer, housekeeping manager and accounting technician.

For more information, call 634-2316.

### Environmental assessment

Beale will soon implement eight construction, repair, upgrade and enhancement projects throughout the base. The Multi-Project Environmental Assessment is a collective analysis of these eight projects planned for implementation during 2007 and 2008.

The assessment is a tool to analyze development projects in support of current and future mission requirements.

The objective of the assessment is to disclose and analyze potentially significant environmental impacts.

In accordance with the National Environmental Policy Act, the Air Force is required to prepare the assessment and provide documentation to the public for review. The review period for this assessment is 30 days. The document will be available for review at the Beale Environmental Flight office, 6601 B Street for 30 days from the date of this publication. Copies may also be obtained by calling 634-2844.